Thalassologies of Empire and Republic:
Competing for knowledge of the South Eastern Pacific in the Age of Revolutions.

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I, Natalia Gándara-Chacana confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.
Fig. I: The South Eastern Pacific
Abstract

The waters to the south and east of South America came to play increasingly important commercial, geographical, and political roles from the mid-eighteenth century onwards as they crucially connected the Atlantic to the Pacific Oceans. It was British sailor George Anson’s expedition (1740-44) that opened up this little-known waterscape, dominated by Spanish maritime power since the sixteenth century, to an intense competition for knowledge between the European empires. Moreover, by the late 1700s, the active presence of whalers had transformed this environment into a space of economic exploitation, generating new empirical knowledge about its geography and resources. This thesis explores the varying ways in which this maritime space, to be analysed as the South Eastern Pacific (SEP), became integrated into British, Spanish, and Spanish American systems of knowledge from the 1740s to the 1840s. By examining a wide range of primary sources, from manuscript documents including geographical reports and maps, to published texts such as newspapers, periodicals and scientific journals, it argues that the production of knowledge about the SEP became strategic for imperial and nation-building processes during the Age of Revolutions. This thesis’s chapters address how imperial rivalries shaped knowledge production and how the commodification of the oceans impacted the transfer of knowledge, assessing the changes and continuities brought about by the dissolution of the Spanish Empire and the emergence of Chile as a nation-state. It also examines the ways in which knowledge was socially validated, elaborating upon the construction of knowledge as a collective enterprise and emphasising the variety of actors involved, studying traditional figures such as explorers and naturalists, and less-studied actors such as engineers, indigenous sailors, and whalers. By doing so, this thesis contributes new ways of understanding imperial rivalries, the national project of Chile as an emergent republic, and the history of knowledge in Latin America.
Human-induced climate change is transforming oceans at an unprecedented rate. New and disruptive ways of thinking about society’s relationship with nature are needed to understand and tackle this challenge. For historians, this means writing the history of the seas and oceans with a renewed sense of urgency. This study engages with this task and contributes to recent scholarship on environmental humanities by exploring the construction of global geographic knowledge systems and the commodification of seas, processes that are at the centre of academic and social discussions about the Anthropocene and climate change. Specifically, this thesis analyses the changing representations and knowledge constructions of the South Eastern Pacific in the eighteenth and nineteenth centuries. This focus allows me to critically analyse the origins of enduring social representations of the seas as spaces of natural resources for human exploitation and profit.

The production of knowledge stands at the core of the human relationship with nature. Knowledge has enabled human societies to control the sea-space, to design coastal lands, to extend imperial and national dominion, and to exploit marine resources. Yet, as this thesis demonstrates, global knowledge systems about seas are often embedded in imperial and colonial cosmographies. A critical understanding of society’s relationship with nature, then, must take into account the geopolitics of knowledge production. In the case of Spanish America in general and the South Eastern Pacific in particular, the construction of scientific knowledge in the eighteenth and nineteenth centuries was entangled with imperialism, state formation, and the global expansion of capitalism. This study grapples with these entanglements to illuminate how the South Eastern Pacific was integrated into global geographic knowledge systems. In doing so, it uncovers a deep relationship between science, power-politics, and the exploitation of nature, raising important questions that can guide future research on other regions of the world.

Furthermore, this thesis represents an important effort to decentre Eurocentric narratives of the history of science and to tackle inequalities in the production and circulation of knowledge. This research highlights the collaborative nature of knowledge production, showcasing the historical importance of marginalised actors, such as indigenous people, local sailors, and
whalers in the construction of global geographic systems. Likewise, this thesis sheds light on the inequalities of knowledge validation, addressing the power structures in place in the legitimation of scientific knowledge. In particular, it interrogates how social and spatial inequalities impacted historical constructions of what was deemed and recognised as scientific. This focus allows for a critical analysis of the hierarchies of knowledge that have shaped modern constructions and imaginaries of global sciences and knowledge networks. By doing so, this thesis challenges longstanding categories, such as the centre and the peripheries, that dominate our understanding of the past not only in academic settings but in wider society. Crucially, this thesis encourages the reader to rethink the history of knowledge and science in a global context, to question current inequalities and their effect on knowledge production and consumption, and to re-imagine human history in the light of the climate emergency.
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Introduction

In 1834, the British consul-general in Buenos Aires, Woodbine Parish (1796–1882), published a descriptive account of the historical and natural features of Juan Fernández Island and the little-known Western Patagonian archipelagos in the journal of the Royal Geographical Society of London. This account was a translation from a 1774 Spanish military expedition to the South Eastern region of the Pacific Ocean and had initially been published by the French Geographical Society the same year (1834). According to Parish, it was in the interest of Britain to acquire the geographical knowledge produced previously by the Spanish military expeditions.¹ He presented the report as evidence that the Spaniards “were not altogether so indifferent to the progress of maritime discovery” as it was hitherto believed.² Furthermore, Parish’s article summarised the knowledge produced by Spanish American expeditions organised by the colonial authorities to explore and survey this uncharted region. This is significant as it highlights the role of Spanish American actors in the production of knowledge about the Pacific region. As has been recently acknowledged by Gregory Cushman, Latin America has been largely overlooked in studies of the history of the Pacific Ocean.³ Parish’s text is riven with the tensions of knowledge transfer in the Age of Revolutions. His journal article draws attention to the main concerns of this thesis. First, it addresses the geostrategic importance of the South Eastern Pacific (SEP) as a connecting space for transoceanic navigation, crucial for the interest of expansion of the competing European empires to the Pacific region. Second, it showcases the relevant role of geographical knowledge for state and empire-building, and for the imperial rivalries of the late-eighteenth and early-nineteenth centuries. Third, it highlights the transnational nature of knowledge production and circulation,

² Parish, 182.
illuminating the role of Spanish American science practitioners in the global networks of geographical knowledge, hitherto marginalised from historiographical analysis.4

During the Age of Revolutions, from the mid-eighteenth to the mid-nineteenth centuries, the waters and coastal lands to the south and east of South America played an increasingly important commercial, geographical, and political role. Crucially, this maritime region to be analysed as the South Eastern Pacific (SEP), including the linking passages of Cape Horn and the Magellan Strait connected the Atlantic and Pacific Oceans, bridging Europe and the Americas with the Pacific World. For the purposes of this research, the SEP is understood as a fluid connecting space that expands from the coastal waters of northern Chile to the southern littoral of East Patagonia and the southern Atlantic islands. This maritime area, however, is not a naturally pre-existing space, but a historical and cultural construction. Modern definitions of the South Pacific do not necessarily match historical understandings of maritime and navigational spaces. In the early modern period, the boundaries between the South Atlantic and South Pacific Oceans were not clearly defined in the geographical imagination of explorers, geographers, and mapmakers. Even more so, these southern seas were conceived as one continuous maritime region, as eighteenth-century voyage accounts show.5 Recent historiography has emphasised the importance of this connecting maritime region, addressing in particular how the southern maritime passages and the southern Atlantic islands were an integral part of South Pacific geographies. This thesis further contributes to this research by adopting the term ‘South Eastern Pacific’ to designate the region, as it highlights its importance for new understandings of the Age of Revolutions that decentre Atlantic narratives.

During the early modern period, the SEP nominally came under the political sovereignty of the global Spanish Empire. However, the sporadic presence of British, Dutch, and French vessels hindered Spanish dominance and political and geographical control. Ever since Francis Drake’s expedition in the late sixteenth century, the SEP had been regarded as the first line of defence


[antemural] of the Spanish possessions in the Pacific region. The periodic attacks of Dutch and British privateers during the seventeenth and early eighteenth centuries shaped the Spanish perception of the SEP as the portal to the Spanish Pacific, a key space to wealth of the Peruvian viceroyalty, and as a place that was deeply connected to the Atlantic world. Furthermore, the islands of the SEP, namely the Juan Fernández, Mocha, Desventuradas, and Chiloé Islands, had been used by British buccaneers and privateers as refuges during the seventeenth and early eighteenth centuries. These enterprises, although intermittent, had demonstrated the feasibility of navigating the SEP. In spite of this, by the mid-eighteenth century, the waters and coastal lands and islands of the SEP remained very little-known to the European empires and the colonial subjects of the Spanish Empire in the Americas. This region was peripheral to transoceanic navigational networks. Specifically, the SEP’s connecting passages --Cape Horn and the Magellan Strait-- represented secondary navigational routes since their navigation was deemed too risky and hazardous when compared to the passage around the Cape of Good Hope, the main route for navigation from Europe to Asia. Nonetheless, as the European empires were expanding towards the Pacific region, it became increasingly important to investigate the safest and most efficient route to traverse from one ocean to the other. The changes brought about by the Age of Revolutions transformed the hitherto marginal waters of the SEP into an important site for transoceanic navigation: it became a global maritime space. Furthermore, developments in naval technology and shipbuilding made navigation via the southern passages of Cape Horn and the Magellan Strait safer, thus fostering the connection of the Atlantic to the Pacific through the SEP.

Indeed, the Age of Revolutions saw significant changes in the SEP’s territories and geographical representations. British ventures across the Pacific in the early 1740s opened up the southern passages and Chile’s rugged coastline to a process of exploration and knowledge production. The subsequent voyages of renowned British officials John Byron and James Cook in the 1760s and 70s intensified the production of knowledge about this maritime region as part of the search for the best navigational route to connect the Atlantic with the Pacific Ocean. The British interest in the South Pacific incited a significant response from Spanish imperial agents, who ordered the organisation of several surveys in this region that led to the accumulation of a substantial corpus of knowledge about the SEP and its coastal lands and islands. Furthermore,

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by the late 1700s, the active presence of sealers and whalers transformed this natural waterscape into a space of economic exploitation, generating new and empirical knowledge about southern geographies. By the early nineteenth century, the SEP’s waters had attracted political, scientific, and economic attention from various transnational actors, acquiring more relevance in global and regional navigational networks.

Historians have paid considerable attention to the place of land in cultural and political imaginings in both the imperial and national contexts in the history of Spanish America. This same critical attention has not been paid to the sea or the coast. This research focuses on the SEP during the Age of Revolutions, a period where the Spanish American colonies emerged as new republics, the Spanish Empire lost its political, economic, and geographical dominance, and the British Empire emerged as a global power. In particular, this thesis explores the construction of knowledge about the SEP from the mid-eighteenth to the mid-nineteenth centuries, highlighting the geopolitical dynamics and outcomes of this process. Knowledge, in particular geographic, cartographic, and hydrographic knowledge became the tools of the modern states and empires, as C. A. Bayly has remarked. Building upon Bayly’s assertion, this thesis analyses the transnational production, circulation and transfer of knowledge about the SEP, focusing primarily on British and Spanish imperial representations, as well as on colonial and republican Chilean views. By doing so, this thesis offers new ways of understanding imperial competition in the Age of Revolutions, and change and continuity between the colonial and national periods in Chile, while also contributing to the history of knowledge and science in Spanish America.

Furthermore, this thesis offers an invitation to look at the Age of Revolutions from the viewpoint of the SEP. Traditionally, historians have studied this period with a notable focus on the Atlantic axis. With regards Spanish America, this means that attention has primarily been paid to the Caribbean region and the South Atlantic rim, neglecting the regional differences of other geographical spaces. An analysis that foregrounds the SEP will facilitate new ways of thinking about Spanish America and its entanglements with global networks. As Armitage and Subrahmanyanam have recognised, the Age of Revolutions was a period of profound transformations during which “the local and the global were rearticulated in radical ways”.

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9 David Armitage and Sanjay Subrahmanyanam, The Age of Revolutions in Global Context, c. 1760-1840 (Basingstoke: Palgrave Macmillan, 2009), 20. I have adopted the plural “Revolutions” instead of the traditional singular form following Armitage and Subrahmanyanam who highlight the global reach of the historical
Recent research has addressed the global impact of imperial competition, crisis, and revolutions of the late-eighteenth and early-nineteenth centuries, acknowledging the diverse and localised responses of this critical historical period. Building on this historiography, this thesis asks about the different ways in which the Age of Revolutions shaped the construction of knowledge and geographical imaginations of the SEP. I argue that the production, circulation and validation of geographic, hydrographic and cartographic knowledge about the SEP was transformed into a political tool for imperial competition, empire-building processes, and the national projects of the emergent Spanish American Republics in the Age of Revolutions. In this vein, this thesis examines how the imperial rivalries between Britain and Spain in the late-eighteenth and early-nineteenth centuries shaped the construction of knowledge about the SEP, what were the changes and continuities brought by the dissolution of the Spanish Empire and the emergence of Chile as a nation-state, and how the commodification of the oceans impacted the transfer of knowledge about this region. Moreover, this research further examines how knowledge was produced and circulated, which actors were involved in these processes, and how knowledge was socially validated.

**Periodisation**

The Age of Revolutions is a long-standing historiographical concept. The term was “used in the period and has carried on being used to describe the set of decades at the end of the eighteenth and the start of the nineteenth century”. For the Spanish American territories, the Age of Revolutions saw an intense period of reform, and, significantly, the change from colonies to republics. In his analysis of the period, Jeremy Adelman has emphasised the way in which most of the changes during the Age of Revolutions can be attributed to geopolitical motives, analysing how the Iberian empires and their colonies “were part of an interlocking system of imperial competitions”, where change and adaptation was crucial. This view further supports the central argument of this thesis, framing the construction of knowledge of the sea transformations during this period, and the different dimensions of these changes by regions. Recent research has also adopted the use of the plural form, see: of Sujit Sivasundaram, Waves Across the South: A New History of Revolution and Empire (London: Harper Collins, 2020), Gabriel Paquette, The European Seaborne Empires. From the Thirty Years’s War to the Age of Revolutions. New Haven: Yale University Press, 2019.

11 Sivasundaram, Waves Across the South, 18.
and coastal lands in a context of changes and adaptations implemented by colonial empires and the emergent nation-state. Central to these processes of transformation and reform were the creation of geographical knowledge and territorialisation of the American spaces, that is, the rationalisation, regulation, and mapping of continental territories and their shores. By the mid-1700s, knowledge about the coastal waters, particularly in places used as stepping stones in the navigation from Europe to Asia, became geopolitical instruments in a period of intense imperial competition for commercial and political dominion over the oceans. Political authorities thought it useful to link geographical knowledge with important maritime routes, “thereby turning geography into hydrography”, as has been recognised by Buschmann, Slack, and Tueller. In Chile, this led to the surveying of the continental coast and adjacent islands, as well as the exploration of the remote geographies of Western Patagonia and the connecting maritime passages to the Atlantic Ocean during the late eighteenth and nineteenth centuries.

Historians of Latin America have created a sharp divide between the colonial and republican periods. The concept of the ‘Age of Revolutions’, instead, offers a more comprehensive framework that entangles the region in global processes of change, adaptation, disruption, and political revolution. The adoption of this framework has allowed historians of Spanish America to “highlight significant economic, social, political, and cultural continuities and changes” between the colonial and the republican periods. In particular, the use of this concept permits scholars to re-assess how disruptive was the independence of the American territories from Spanish imperial rule, “bridging Spanish America’s late colonial and early postcolonial history”. Furthermore, its use allows historians to link national histories with broader problems and regional contexts, overcoming restrictive narratives that centre on particular nation-states.

Most historiography on the Age of Revolutions in Spanish America starts in the 1760s, as the Bourbon Crown introduced several administrative reforms to confront and adapt to changing international conditions, and finish in the mid-nineteenth century, when the post-colonial

13 Armitage and Subrahmanyam’s The Age of Revolutions in Global Context has created a global analysis showing the differences between diverse regions and oceanic spaces. Sivasundaram’s Waves Across the South has recently argued that the Age of the Revolutions saw the reconfiguration of political organisation in the Indian and Pacific Oceans. Sivasundaram, Waves Across the South, 18.
17 Uribe-Uran, 426.
regimes reached a certain stability and consolidation. However, as the SEP has its own historical particularities, this research expands this timescale, starting in the 1740s. The construction of knowledge about the SEP was triggered and shaped by the imperial rivalries of European empires, especially between Spain and Britain. In the early 1740s, the British organised a military expedition commanded by George Anson (1697-1762) to disrupt Spanish dominion in the Pacific and to capture the wealth of commercial networks between Spanish America and the Pacific territories. Anson’s enterprise exposed the fragility of Spanish defences in the Pacific, as previous scholarship has highlighted, but also produced relevant geopolitical knowledge about this region, particularly about the SEP. This knowledge was then published in a voyage account, circulating widely, both in Europe and in the Americas. As a result, Spanish authorities in the metropolis and in the colonies mobilised important resources to produce new geographical and hydrographical knowledge about the SEP, promoting expeditions to survey the coast, its adjacent islands and the peripheral region of Patagonia, such as that conducted by Jorge Juan and Antonio Ulloa (1740-1743) and Manuel Brizuela’s expedition to the Patagonian Channels (1750). Moreover, Anson’s endeavours stimulated further British expeditions in the 1760s with a clearer aim of producing new knowledge about the geographies and coastal waters of the Pacific, as Glynn Williams has argued.

This thesis concludes in the early 1840s, a period in which several global, regional, and national processes intersected. First, steam transformed the speed and extent of maritime navigation in the southern hemisphere. As the case of the Indian Ocean shows, steam-driven vessels accelerated seaborne knowledge, especially in regions where navigation was difficult due to contrary winds and currents. Steam made navigation safer, and therefore enabled scientific studies to take place. Furthermore, the second half of the 1800s saw the acceleration of global scientific exchange. According to Bayly, “when the railway, the telegraph, and the steamship had hugely improved the global exchange of information, fixed scientific bureaucracies were

coming into being.” In Spanish America, this process was entangled with the consolidation of the republican order during the second half of the century. The Chilean context in the 1840s represents the initial stage of this process. It is marked by the victory over the Peruvian-Bolivian confederation in the late 1830s and the incipient dominion of Chile over the SEP. This was also bolstered by the Chilean occupation of the Magellan Strait in 1843, which allowed Chile to control an important geostrategic gateway between the Atlantic and the Pacific oceans and established their territorial sovereignty over this maritime space. Moreover, during this decade there were important institutional changes in the construction of scientific knowledge with the foundation of the University of Chile and the creation of the Ministry of the Navy in 1843, which enabled the founding of specialist scientific bodies dedicated to hydrography in the second half of the century.

The construction of knowledge about the sea was far from a linear process, however. There were important periods when competition among European empires, particularly that between Spain and Britain, accelerated the intensity of their rivalry and made the need for geographical knowledge more pressing. For example, the British settlement of the Falkland Islands in the 1760s intensified the production and circulation of knowledge about the region. Similarly, Spanish acts of possession in Nootka Sound in the Northeast Pacific in 1790 incited international conflict between the Spanish Empire and Britain, leading to Spanish hydrographic surveying campaigns across the Eastern Pacific throughout the 1790s. There were also moments of important disruption, particularly those marked by armed conflict. For example, the Independence Wars in Spanish America not only paused the majority of scientific enterprises, they also led to the loss of a great deal of information and knowledge. The dissolution of the Spanish empire and the largely uncontested oceanic dominion of Great Britain after the Napoleonic Wars brought important geopolitical changes to the region in the early-nineteenth century. In this shifting context, the Spanish expeditions were succeeded by Chilean hydrographic endeavours. During the 1830s and early 1840s, the Chilean Republic went through a period of relative institutional stability that enabled officials in the Army to

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23 Recently Maxine Berg has emphasised the local and global importance of the Nootka Sound site: “It has a very local history as a place of seasonal residence and ceremony for the Mowachaht people (…) [and] it was [also] the site of an international incident in 1790— the Nootka Crisis between Spain and Britain, which witnessed the British issuing an ultimatum of war after Spanish acts of possession at Nootka, and provocation of British and American merchant vessels arriving there. It was also the place of the Nootka Conventions of 1790–4 that settled disputes over claims to territories and led, some decades later, to the settlement of borders between the US and British Columbia” Maxine Berg, “Sea Otters and Iron: A Global Microhistory of Value and Exchange at Nootka Sound, 1774–1792,” Past & Present 242, no. Supplement 14 (2019): 51.
conduct hydrographic surveys along the Chilean coast. Further, British dominance over the world’s oceans was cemented by a number of scientific endeavours commissioned by the Admiralty. Such was the survey conducted by Phillip Parker King and Robert Fitz Roy on board H.M.S. *Beagle* (1826-1836), which surveyed the SEP in considerable detail, producing a remarkable amount of geographic, cartographic, hydrographic knowledge.

**Context**

**The South Eastern Pacific**

The vast maritime region acknowledged here as the South Eastern Pacific is an “intellectual construct”. It was produced by different actors who experienced and created knowledge based on their cultural and historical relationships with this environment. In the Age of Revolutions, there were two main sub-regions: the transimperial SEP and the local SEP. On the one hand, imperial actors, namely British and Spanish metropolitan agents, created knowledge and interacted with the SEP navigating (mostly) across open waters, and visiting certain islands such as Staten, Tierra del Fuego, Juan Fernández, and Chiloé Islands, as well as key ports such as Concepción and Valparaíso. This space comprises the transimperial SEP. On the other hand, local actors, both Spanish American and indigenous, created distinct spatial networks. They experienced this maritime region by navigating and surveying coastal waters, configuring the space of the local SEP. This distinction is particularly relevant for the southern parts of the SEP. The two thousand kilometres that separate the Chiloé archipelago from the Magellan Strait, were mostly navigated, explored, and surveyed by local Spanish American expeditions. This region, known as Patagonia’s interior sea [*mar interior*] –characterised by shallow waters, intricate channels and fjords, and extreme weather conditions throughout the year–, was peripheral in transoceanic navigation, yet strategic for the political and symbolic dominion of the SEP. Thus, while the open waters and the connecting passages of Cape Horn and the Magellan Strait were transnational contested spaces for the European powers; the Patagonian interior sea was a space largely navigated by Spanish America-based explorers, including *peninsulares*, creoles, *mestizos*, and indigenous sailors. Chiloé Islanders, in

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particular, had a crucial role in the defence and production of knowledge about West Patagonia, as has been studied by Walter Hanish and Ximena Urbina. 25

As a result, this thesis engages with a diverse range of knowledge producers, from well-known imperial figures such as George Anson, James Cook, and Alexander Malaspina, to Spanish America-based hydrographers such as José de Moraleda and Felipe Solo de Zaldivar, to anonymous local Spanish American and indigenous sailors. Moreover, it includes hitherto marginalised figures from imperial accounts of the South Pacific such as British sealers and whalers, who are characterised as active knowledge producers in the construction of the SEP’s geographies. In particular, this thesis centres on the contributions of Spanish Americans to the production of Pacific knowledge. As Jorge Cañizares-Esguerra has recognised, the traditional categories that structure the study of early modern science, organised around the “liberal epistemological regime of facts, objectivity, scepticism, print culture, the public sphere, and the Republic of Letters”,26 have obscured the contribution of Spanish imperial actors. As I show over the course of this project, this is especially true for Spanish American and indigenous agents. However, their collaboration and participation in the creation of imperial and national knowledge about the Pacific was crucial. In this vein, this thesis highlights the role of local Spanish American and indigenous sailors, commonly called prácticos by the Spanish American colonial authorities. Their knowledge and expertise, especially in the most peripheral and little-explored regions of the SEP, such as the Patagonian channels, was regarded as highly relevant for creating in-situ knowledge about the SEP. Yet, their voices and contributions are difficult to identify and interpret because of the depth and density of colonial discourses and power structures within which their knowledge productions are framed. This sets an important methodological limitation that, nonetheless, needs to be acknowledged. All in all, these local actors engaged actively in the production of imperial and republican knowledge about and images of the SEP.


Knowledge Production in Spanish America

The division of the history of Spanish America into colonial and national periods has allowed certain assumptions to become entrenched.\textsuperscript{22} One of them is the idea that national sciences started almost from zero after independence and were mostly developed by European and North American scientific practitioners.\textsuperscript{28} While it is important to recognise the role of European intellectuals and professionals in the development and institutionalisation of Latin American sciences, the considerable emphasis placed upon their work in much of the existing scholarship crucially obscures previous or alternative forms of knowledge making. Furthermore, this perspective overestimates the influence of these individuals, often reproducing Eurocentric narratives of the history of science in Spanish American countries. The case of Chile, particularly with regards the construction of knowledge about the SEP, illuminates important continuities between the late colonial and early national period in terms of knowledge practices, the actors involved in the production and circulation of knowledge, and the emergence of an incipient process of the institutionalisation of science. Moreover, it allows us to highlight the regional circulation of Spanish American science practitioners. This, in turn, offers an opportunity to think about Latin American networks and regional transnationalisms, and concurrently challenges prevailing narratives that solely focus on trans-Atlantic networks.

The history of science and knowledge in Latin America has much to contribute to the discussion of change and continuity from the colonial to the republican regimes. Cultural and intellectual historians in Chile have addressed the importance of the Bourbon Reforms in the modernisation and institutionalisation of higher education in the late colonial period, particularly as they led to the creation of the University of San Felipe (1756) and the San Luis Academy (1797), the first establishment of vocational education.\textsuperscript{29} According to Serrano, Ponce de León and Regifo, these institutions enabled the secular education of the criollo elite in different fields of knowledge. However, as these historians have explained, the scope of these institutions was limited, as only the humanistic studies of law, philosophy, and theology managed to consolidate in this early period.\textsuperscript{30} The University of San Felipe, for example,

\textsuperscript{22}Eric Van Young, “Conclusion. Was there an Age of Revolution in Spanish America?” in \textit{State and Society in Spanish America during the Age of Revolution.}, ed. Uribe-Urán, 224.

\textsuperscript{28}See, Zenobio Saldívia, \textit{La Ciencia en el Chile Decimonónico} (Santiago de Chile: Universidad Tecnológica Metropolitana, 2005), 37-38.

\textsuperscript{29}Bernardo Subercaseaux, \textit{La Historia del Libro en Chile (Alma y Cuerpo)} (Santiago de Chile: LOM, 2000); Alfredo Jocelyn-Holt, \textit{La Independencia de Chile. Tradición, Modernización y Mito} (Santiago de Chile: DeBolsillo, 2009); Sol Serrano, Macarena Ponce de León, and Francisca Rengifo, \textit{Historia de la Educación en Chile (1810-2010). Tomo I. Aprender a Leer y Escribir (1810-1880)} (Santiago de Chile: Taurus, 2018).

\textsuperscript{30}Serrano, Ponce de León, and Rengifo, \textit{Historia de La Educación}, 59–60.
struggled for decades trying to settle the lectureship of mathematics,\textsuperscript{31} and the San Luis Academy survived for only a short period before it was absorbed by the foundation of the National Institute (1813) in the midst of the Independence Wars. Overall, the reforms promoted by the Spanish Crown and the local elites created the conditions for an education and knowledge infrastructure, which was provided by the state instead of the Catholic Church.\textsuperscript{32} With the dissolution of the imperial rule of Spain, the new republican governments in Chile pushed the modernisation of the educational and academic institutions even further. In addition to the aforementioned National Institute, the Chilean governments during the 1820s and 1830s founded new knowledge institutions, such as the National Library (1813) and the National Museum (1830), among others. The focus on science and knowledge production enables historians to understand these institutions as the intellectual and cultural framework within which scientific endeavours emerged in the late colonial and early national periods. Indeed, it is only recently that historians such as Irina Podgorny and Rafael Sagredo have begun to study the continuity from colonial to republican science, highlighting the common practices, methodologies, ideas and legacies of colonial science practitioners into the nineteenth century.\textsuperscript{33} Building on this idea, this thesis examines how late colonial scientific practices, institutions, and knowledge not only continued from one period to the next, but also how they laid the foundations for the institutions that emerged in the new republican regimes.

Despite these continuities, the imperial crisis “brought about decisive changes” in Spanish America, as Hilda Sábato has remarked.\textsuperscript{34} In particular, the development of knowledge infrastructure and institutions led to the emergence and consolidation of the new republics throughout the nineteenth century. According to Nicola Miller, “access to knowledge was intrinsic to the legitimacy of the new republics”, as the Spanish American republics were

\textsuperscript{31} José Toribio Medina, \textit{Las Matemáticas en la Universidad de San Felipe.} (Santiago de Chile: Universidad de Chile, 1952), 16.


founded on the premise of enlightenment for all.\textsuperscript{35} The case of the Chilean republic is significant for exploring the changes brought about by the new political regime with regards knowledge infrastructure and institutions. Compared with its neighbours, Chile managed to create republican institutions and achieve relative political stability more quickly than other countries in the region. With less political strife, Chile’s republican regimen was consolidated in the 1830s as conservative groups held power, inaugurating a period of economic and institutional development. The republican governments actively engaged with the development of educational institutions and the promotion of scientific research in the territory. Since the early years of the post-colonial regime, the criollo elites understood the education of the people as one of the chief roles of the state. In the 1830s and early 1840s, the Chilean state increased its capacity to promote the production and circulation of knowledge. Notably, the foundation of the University of Chile (1842) was crucial for the development of Chile’s educational system.\textsuperscript{36} As has been stated by Serrano, the University of Chile “was an innovative project that aimed to modernise the structure of the intellectual system regarding the production and circulation of knowledge”.\textsuperscript{37} The inaugural speech of its founder, Andrés Bello (1781-1865), precisely portrays the role of the university in the production of knowledge for nation-making, arguing how the university’s aim was be useful to the fatherland and the republican rule.\textsuperscript{38} With the foundation of the university and other higher educational institutions, such as the Normal School for the training of teachers (1842), and the development of the periodical El Araucano, a state-sponsored publication that disseminated scientific works, Chile develop a lasting knowledge infrastructure earlier than most of the other new states in the region.

Furthermore, the Chilean Republican governments further promoted the study of the territory and its natural history. During the 1820s, the government of Ramón Freire organised a scientific commission to create a topographical map of the Chilean territory commanded by the French engineers Charles Lozier (1784-1865) and Joseph Backler D’Albe (1789-1824). However, the political and economic upheavals of the early republican years made impossible the success of this scientific enterprise. The interest of studying and surveying the Chilean territory persisted among the republican elite, who believed it to be of great utility for the

\textsuperscript{38} Andrés Bello, “Instalación de La Universidad,” \textit{Anales de La Universidad de Chile} 1 (1843): 139–52.
economic progress and administration of the Chilean state. In 1830, the new Conservative government contracted the French naturalist Claude Gay (1800-1873) to study Chile’s “natural history, geography, geology, statistics, and everything that contributes to the knowledge of the country’s productions, industry, commerce and administration”.\(^{39}\) With this knowledge enterprise, along with Ignacy Domeyko’s geological research, Chile developed an important body of knowledge about their territory and resources by the mid-nineteenth century.

Another important change brought about by the independence movement was the expansion of print culture in Spanish America.\(^ {40}\) In the case of Chile, Bernardo Subercaseaux has emphasised how printing was adopted by the Chilean criollos in the early stages of the independence process as a political and ideological instrument to educate the public.\(^ {41}\) Indeed, the expansion of print culture and the growing popularity of books changed the way in which geographic, hydrographic, and cartographic knowledge circulated and was consumed in Chile from the 1820s onwards. The most significant outcome of this was the shifting nature of knowledge, which went from being a state affair that circulated solely among colonial officials to becoming a public matter that circulated among an educated readership via the press, books, and, later, atlases. Only recently has historiography started to study and define the critical role that print culture played in the early Spanish American republics.\(^ {42}\) Building on this research, this thesis underscores how the changes brought by the print culture paved the way for the foundation of new national imaginaries concerning the republic’s territory, population, and resources.\(^ {43}\)

**Historiographical discussion**

While adopting the periodisation of the Age of Revolutions to study the SEP, this research also brings together two different historiographical traditions: the history of seas and oceans and the history of science and knowledge.

\(^{39}\) *El Araucano*, 2 October 1830, 3.


\(^ {43}\) Del Castillo, *Crafting a Republic*, 33.
A New Thalassology

Traditional maritime history, focusing on activities such as trade, naval warfare, exploration and fishing, was transformed by Fernand Braudel’s Mediterranean. As a spatial theorist, Braudel described the Mediterranean region by analysing the interlinking web of relationships between geography, sociology, economics, politics, and material culture across the Mediterranean world. After Braudel’s work, seas and oceans acquired significant importance as units of historical analysis in their own right. As Alison Games has explained in the case of the Atlantic, the ocean has become an organising principle for examining the histories of the landmasses they link together. Following this principle, there is currently a buoyant historiography of the Atlantic, Pacific, Indian, Arctic and Antarctic Oceans, as well as well as of the Mediterranean, Red, Baltic, South China, Black, and East seas. This renewed interest has been defined as a ‘new thalassology’, which can roughly be understood as a “turn towards the waters of the world, the dwellers on their shores and islands, and the modes of interaction across maritime spaces”.

This turn to waterscapes offers historians unique opportunities to develop regional and transnational histories that can overcome the strands and rigid boundaries of state-centric histories. As Armitage, Bashford, and Sivasundaram have acknowledged, historiographies concerned with oceans and seas “revise traditional spatial considerations”. Moreover, they create new categories that allow historians to subvert European and North-Atlantic hegemony in historiographical analysis. As the spatial and global turns in historical scholarship have increased in popularity, seas and oceans are being examined as key spaces of “movement and interconnections”, where global processes intersect with local practices. Furthermore, these

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50 Sivasundaram, *Waves Across the South*.
maritime spaces allow historians to engage not only with the connections and entanglements of different human communities, but also with those linking human and non-human agents. As has been recognised by Armitage and Bashford, the Pacific is something of a “latecomer to these new oceanic approaches to supranational history”. In recent decades, the region has been the focus of an increasing historiographical interest, particularly as historians engage with transnational entanglements, migrations, and the circulation of objects, animals, and ideas. Nevertheless, attempts to write a comprehensive history of the Pacific remain elusive. A significant difference between the Pacific and other oceanic regions is its vastness; it encompasses a number of highly diverse regions. As Matsuda reminds us, the Pacific is not a defined space, but includes multiple seas, cultures, and peoples, therefore it “is best understood in particularities”. Following this line of thought, Bashford has identified six axes for studying the history of the Pacific, connecting the different regions geographically and chronologically. One historical axis identified by Bashford connects the South American rim with the coasts of New Holland and New Zealand, South East Asia, and the South Pacific Islands during the eighteenth and nineteenth centuries. This axis has received considerable attention in scholarship; however, the South American Pacific rim has traditionally been marginalised in works that prioritise the history of explorations, cultural encounters, and commercial exploitation across the Pacific Islands and the coasts and islands of Oceania.

Recent historiography has begun to address the importance of the continental rims in the history of exploration and cultural encounters in the Pacific. Ryan Tucker Jones, for example, shifts his focus from Pacific islands to the North Pacific, emphasising the movement between Russian

52 Armitage, Bashford, and Sivasundaram, Oceanic Histories, 19.
53 Armitage and Bashford, Pacific Histories, 6.
and North American shores. Similarly, David Igler’s *The Great Ocean* has positioned the North American rim as part of an increasingly flourishing maritime route, connecting these shores to a wider Pacific world by tracing the paths of whalers, naturalists, traders, and mariners, as well as the movements of labour from the 1760s to the 1840s. Only recently has the South American region received more historiographical attention. Cushman’s research on guano exploitation on the nineteenth century, as well as Mariano Bonialian’s *El Pacífico Hispanoamericano*, and Buschman, et al.’s *Navigating the Spanish Lake*, redress this imbalance, connecting the Spanish American Pacific Rim to global exchanges and to the movements of people and goods in the broader Pacific.

Building on the research outlined above, this thesis on the construction of knowledge about the South East Pacific will add a new dimension to Pacific Ocean historiography, emphasising the importance of a region largely ignored by current scholarship. Moreover, my focus on the southern passages that connect this region to the Atlantic Ocean links oceanic regions that have been artificially divided by historiography, addressing what Armitage has called ‘extra-Atlantic history’. The SEP is also connected to the Southern Ocean, as the movements of explorers, sealers and whalers in the late-eighteenth and nineteenth centuries demonstrate. By studying the passages that connect the Pacific with the Atlantic and Southern Oceans, this research contributes to the historical understanding of these maritime spaces, blurring the lines of the fixed, modern categories such as Pacific metageographies that often obscure historical understandings and practices. In this vein, the SEP, as with other oceanic spaces, is not a naturally delimited space. It is a historically constructed space.

Recent Pacific historiography has paid attention to the problem of circulation and how the movement of people, animals, and goods have shaped the history of this oceanic space. However, less has been said about the process of the construction of knowledge about the

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59 Igler, *The Great Ocean*.
Pacific, and how it came to be conceptualised in global knowledge systems. Mercedes Maroto’s and Katherine Parker’s works are notable exceptions. By studying map production and circulation, these historians reveal changing representations and ideas about the Pacific Ocean in the early modern period. Building on this scholarship, this research will analyse how the specific region of the South East Pacific, including the southern passages, was constructed and integrated into global knowledge systems in the volatile period of the Age of Revolutions, against a backdrop of increasing imperial rivalries and imperial and national processes of territorialisation.

This new emphasis on seas and oceans has been pursued in order to “escape the ‘terracentrism’ of traditional history-writing”. This has given historians the opportunity to emphasise the role of often-marginalised littoral societies, ports, islands, and coastal places by linking them to regional and global processes. From the 1980s onwards, there has been an incipient interest in shores as a particular subject of historical analysis. Alain Corbin’s seminal study *The Lure of the Sea* explores the origins of Western Civilisation’s modern relationship with the sea and the practices that emerged between the 1750s and the 1840s. Corbin’s research has been influential in the study of coastal environments as places of scientific interest, especially with regards to geological research on the coasts, changing attitudes to the shore, and what he has called the ‘invention of the beach’.

Through the comprehensive lens of environmental history, John Gillis and Christopher Pastore have explored the ways in which different epochs have shaped historical understanding of and social practices on the world’s shores. Particularly relevant for this thesis is Gillis’ analysis of the process of rationalisation of the planetary shores in the eighteenth and nineteenth centuries. In his view, coastlines are modern constructions that emerged from mapping practices fostered by modern nation-states.

Similarly, there is an emerging historiography that is reassessing the place of ports and islands in global history. Sujit Sivasundaram has used the case of Sri Lanka’s main port, Colombo, to

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highlight how port cities became hubs for transnational connections and cultural entanglements during the late nineteenth and early twentieth centuries. He has also stressed how in this way, ports also became places of disruption and disconnection as the imperial authorities enforced new urban planning and ways of understanding and experiencing the city. Notably, Sivasundaram challenges global history narratives that solely focus on connections and movements, allowing historians to question the ways in which the processes of globalisation and integration also brought about disconnection and disruption. This is particularly insightful for the consideration of change and continuity in geographical representations and imaginaries in Spanish America. Likewise, islands are increasingly becoming a subject of historical analyses for areas impacted significantly by cultural encounters, colonialism, commerce and trade, which makes them especially interesting for the study of processes of globalisation, imperialism, and nationalism, among others. Moreover, islands have also received considerable attention from historians of science, who have examined them as scientific laboratories, archives, and fields of exploration, as well as sites where different cultures and modes of knowledge come into contact. As Kroupa, Mawson, and Brixius have recently argued “islands can exemplify a multiplicity of functions and dimensions, they allow for a dynamic understanding of the spectrum of agents and agendas involved in knowledge production and mobilization in cross-cultural settings”. This perspective illuminates the analysis undertaken in this research as it uses the exceptionality of islands and coastal places to understand how these spaces have been shaped by practices of knowledge construction and circulation, as well as how these environments have shaped these processes in reverse.

Particularly relevant to this dissertation is the work of historian of science Rafael Sagredo, who emphasises the importance of maritime and geographical knowledge as the basis of both the colonial and the republican projects in Chile. Previous historiographical research had focused on traditional maritime history themes, such as discoveries and exploration, shipwrecks, and

naval warfare. Most of this work has been written within a national framework, which has tended to emphasise a narrative of the uniqueness and isolation of Chile. Sagredo’s work, on the contrary, focuses on the hydrographical enterprises undertaken in the SEP during the late-eighteenth and nineteenth centuries, opening up the study of hydrography as both an imperial and a national endeavour. An important drawback is the marked difference that Sagredo draws between the colonial and republican periods. According to him, the exploration of this maritime space in the eighteenth and nineteenth centuries was based on two different rationales: in the cases of the Spanish and British empires, the surveys of the Chilean coast were motivated by commercial and political interests, whereas the Chilean government’s aim was to explore these shores in order to secure Chilean sovereignty. Building on Sagredo’s research framework, I will propose a more nuanced analysis of the changes and continuities in the production of knowledge about the sea from the colonial to the republican periods. A significant difference, then, is the relevance attached to the hydrographical expeditions conducted by the Chilean Navy in the 1830s and early 1840s. While Sagredo dismisses them as sporadic events, I highlight their relevance as an example of the continuities of science-making and their importance for the nation-building process in Chile, linking them to wider regional and transnational contexts.

In contrast with Sagredo, Ximena Urbina’s research on Western Patagonia has allowed me to conceptualise the southern maritime regions of the Pacific as spaces that are deeply entangled with networks of imperial circulation and imperial rivalries in the early modern period. Although her analysis is constructed from a ‘terracentric’ perspective, Urbina has examined the different ways in which this space was perceived by local, regional, and imperial authorities. Expanding her analytical framework to the broader region of the SEP, this


75 Sagredo, “De la hidrografía imperial”, 510.

research explores how imperial and national actors created diverse images of this seascape, further emphasising the roles local and indigenous actors played in the creation of knowledge about the SEP. Notably, this thesis differs from Urbina’s research in scope and periodisation. While her research focuses on the seventeenth- and early-eighteenth-century images of Patagonia from a cultural history perspective, this thesis explores the construction of knowledge and geographical representations in the Age of Revolutions, formulating an analysis from the perspective of the history of science and knowledge.

Science in motion

From the 1980s onwards, historians of science have been concerned with the study of the relationship between science, imperialism and nation building, which has led them to look beyond the traditional European and US focuses. According to Palladino and Worboys, this change opened up the field to a broader understanding of science, its practitioners, institutions, and the social context in which scientific activity is embedded. In recent years, the “spatial turn” in the history of science has profoundly influenced the ways in which scholars think about the production and transfer of knowledge. This approach prompts questions about how scientific knowledge is transferred from place to place, challenging previous narratives that highlighted the dependence of global science on European criteria. An important contribution to this perspective has been the idea of spatialised production and circulation of knowledge. As David Livingstone explains, this means understanding the ways in which knowledge transfer has been shaped by its location. This perspective emphasises the links and connections between places/sites of knowledge leading to the creation of “new maps of knowledge and transnational canons” of the transfer of ideas, ideologies, and information across the globe. Moreover, historians of science have centred the idea of science “as a form of communication”, highlighting the way in which science emerged from the movement, circulation, and transfer of ideas and information across the globe. In turn, as Stuart McCook has acknowledged, this

78 Palladino and Worboys, 92.
perspective allows historians to re-think how to write national and regional histories of science.82

For historians of Latin American science, this new analytical perspective has emphasised the agency of scientific knowledge and of science practitioners from the region. Moreover, it has entangled the region with a broader discussion about geographies of knowledge, which challenges diffusionist models that depict the region as peripheral and as mere consumer of European or metropolitan knowledge. However, as Regina Horta warns us, the history of science in the region has often taken on a “nationalist tone”,83 particularly when exploring the relationship between science and nation-building. This national framework, although important for challenging previous conceptions, offers limited ways of thinking about the history of science and knowledge in Latin America as a whole. Nevertheless, emerging research links the production of scientific knowledge to transnational and regional networks of science.84 This broader framework has allowed historians to recast questions about the processes of knowledge production and the circumstances that enable it.85 Furthermore, historians of the region have also contributed to the study of knowledge circulation, how knowledge is transformed and how it changes in transit.86

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83 Regina Horta, “Between the National and the Universal: Natural History Networks in Latin America in the Nineteenth and Twentieth Centuries,” Isis 104, no. 4 (2013): 780.
86 Gänger, “Colecciones y Estudios”; Irina Podgorny, “Fossil Dealers, the Practices of Comparative Anatomy and British Diplomacy in Latin America, 1820-1840,” British Journal for the History of Science; Norwich 46, no. 4
Zenobia Saldivia’s work laid the foundations of the history of science in Chile. His research explored the emergence and institutionalization of science during the nineteenth century, entangling science-making with the processes of nation-state building.\(^{87}\) For Saldivia, Chilean science is a republican matter that emerged in Chile during the 1830s with the presence of European savants and the development of new institutions.\(^{88}\) Departing from Saldivia’s work, recent research on science in Chile has discussed three main ideas. First, historians have questioned the idea of science-making as a solely republican endeavour. Claudio and Flavio Gutiérrez’s work, for example, has focused on the case of physics, addressing the colonial roots of the discipline. By doing so, the authors have challenged the diffusionist model that has remained prevalent in the country’s history of science, taking into consideration the local conditions for the development of the discipline, as well as the influence of foreign science practitioners on the institutionalisation of the field.\(^{89}\) A second subject discussed by historians has been the isolation of Chile’s scientific productions. An important critique of Saldivia’s work is his view of Chile’s science as an isolated case, neglecting its ties with international networks and institutions. In recent years, new research has introduced a transnational perspective to the study of the history of science in Chile. Historians such as Carlos Sanhueza, Stephanie Gänger, Patience Schell, and Catalina Valdés, among others, have analysed Chilean sciences in wider social, political, and scientific contexts.\(^{90}\) Historians have paid special attention to the problem of the circulation of objects, people, and scientific practices and the

\(^{87}\) See, Saldivia, *La Ciencia en el Chile Decimonónico*.

\(^{88}\) Saldivia, 38.


ways in which these processes impact the production and reception of scientific knowledge, as Sanhueza’s recent edited volume demonstrates.91

This emphasis on circulation has directed scholarly attention to a third subject: Chile as a peripheral space of scientific production. During the 2000s and early 2010s, science historians did not question the role of Chile as peripheral place in the global production of knowledge. For instance, the Gutiérrezes’ work presented the development of physics in Chile as an example of the emergence of the field in a peripheral place.92 However, this perspective has been challenged by recent approaches that focus on movement and global networks. This historiographical research aims to blur the lines between ‘centres’ and ‘peripheries’, highlighting how knowledge is co-produced by different actors and places.93 This scholarship has also shed light on the role of those previously considered to be marginal actors, such as local guides, indigenous people, and antique collectors. Nevertheless, the overemphasis on circulation and networks of knowledge may obscure power asymmetries in these interchanges. Patience Schell’s The Sociable Sciences addresses this problem, understanding science as a cultural and a collective experience, recognizing, at the same time, the asymmetrical power relations that are displayed in the production and transfer of scientific knowledge.94

These recent discussions on the history of science in Latin America and in Chile specifically guide the thesis in important ways. Following Gutiérrez and Gutiérrez, this research emphasises the colonial roots of Chilean science, paying particular attention to the cultural and institutional contexts that enabled the production of scientific knowledge. Furthermore, this thesis challenges previous accounts that depict the production of knowledge in Chile as an isolated case, stressing the importance of transimperial and regional networks of knowledge. Lastly, following Schell, this research problematises the power relations involved in the social construction of knowledge, addressing the issue of how hierarchies of knowledge and power played a role in the production, transfer, and social validation of science.

91 Sanhueza, La Movilidad del saber.
92 Gutiérrez and Gutiérrez, “Física: su trayectoria.”
93 Sanhueza, La Movilidad del saber, 15.
Methodological framework

Approach

Transnational History provides the methodological framework of this thesis. Oceans are by definition transnational spaces; however, the approaches of naval and maritime historiography have traditionally been imperial or national in emphasis. Transnational History, as a methodological approach, engages with history beyond the terms of states or nations, enabling historians to overcome the frames imposed by both imperial and national perspectives. From this viewpoint, the idea of ‘nation’ referred to within the term transnational must be understood as a flexible notion encompassing a variety of political units, rather than being restricted to the modern definitions of nation-states. This broad understanding makes it possible to study different political units in a shifting historical scenario such as the Age of Revolutions. As Isabel Hofmeyr posits, Transnational History is concerned with movements, flows, and circulation. This approach allows me to create a framework for examining the highly complex process of knowledge transfer. This is particularly relevant for studying the history of science and knowledge in Latin America, which is often marginalised from the narratives of Western science with Latin American actors being depicted as mere consumers of knowledge. In contrast, the Transnational History approach makes it possible to situate the history of knowledge of the SEP in a network of cultural entanglements, recognising how knowledge is constructed by a variety of actors, and to think more broadly about how space influences the transfer of knowledge. That said, the transnational approach needs to go further than simply addressing the connections between places, objects, and people. It needs to question the nature of these entanglements, and how they intersect with power relations. Following Axel Körner’s ideas, it is important for historical analysis to discuss the asymmetrical nature of intellectual and cultural encounters. This, in turn, enables historians to think about agency and power structures, and to rethink established categories of knowledge transfer.

Fundamentally, the use of this approach poses new questions about the construction of geographic and hydrographic knowledge in the Age of Revolutions. First, it allows historians...
to think about the density and depth of the transnational entanglements. This approach also opens new avenues for assessing the limitations, disruptions, and obliterations of these connections, which is especially important with regards colonial power and in periods of heightened political and military conflict, such as the Independence Wars. Second, Transnational History also permits me to problematise the way in which these connections worked, highlighting inequalities and hierarchies of power and knowledge, which were particularly relevant in the late eighteenth and nineteenth centuries as European institutions were establishing the frameworks of scientific knowledge. Third, the emphasis on transnational connections allows me to contextualise the construction of knowledge about the SEP in the broader context of the territorialisation of global spaces, understanding it as the process via which empires and nation-states regulated, rationalised and mapped their spaces during the eighteenth and nineteenth centuries.100 This approach, then, entangles the SEP with an interconnected global system of political, military, and intellectual networks and exchanges. Lastly, by addressing these connections and circulations, the transnational history approach allows us to reassess the importance of regional networks, contesting the rigid categories of centre and periphery and challenging the Eurocentric narratives that still prevail in the historiography of the region.

Key concepts

An important distinction to be made is the difference between ‘information’ and ‘knowledge’. Following Peter Burke’s definition, this thesis uses the term ‘information’ to refer to specific and practical data, and employs the term ‘knowledge’ to generically address what has been processed and systematised by the human mind.101 This distinction is important for the history of science in Latin America, where actors have previously been understood only as producers of information rather than generators of knowledge, particularly scientific knowledge. The interplay between information and knowledge has been studied by historians of science, who are moving away from the term ‘science’ and embracing the concept of ‘knowledge’ in order to encompass a broader understanding of different ways of knowing.102 Christian Jacob comprehends knowledge “as a set of mental tools, discourses, practices, models, and shared

100 Conrad, What is Global History?, 123.
representations allowing a society or smaller groups in this society to provide the world they live in with meaning and to act upon it”.103 This broad characterisation of knowledge makes it possible to subvert the narrow--and frequently Eurocentric--definitions of ‘science’.104 In particular, it allows me to think critically about what counts as and has been socially recognised as scientific knowledge in a given period and society, and to reflect upon the different classifications and hierarchies of knowledge. In this vein, Dutch historian Lukas Verburgt has recently highlighted the need to historicise what different societies have constructed as nonknowledge and characterised as ignorance. According to him, this focus will enable historians to think more profoundly about “society’s dynamics of knowledge in general, and the relation between hierarchies of knowledge and cognitive authority, more specifically”.105 Significantly, this approach offers new ways of thinking about boundaries, asymmetries, and hierarchies of different forms of knowledge, which are particularly relevant for a transnational approach to the construction of knowledge about a geographic region, such as the SEP.

Moreover, this broad conceptualisation of knowledge has also encouraged me to consider the production and circulation of knowledge as a collective endeavour. Nicola Miller has reflected upon the benefits of thinking about the history of knowledge as involving a wide variety of actors. In her view, a change in focus from famous intellectuals and scientific practitioners to apparently marginal figures may illuminate “shadowy configurations of power that shape the possibilities for knowledge creation in any particular time and place”.106 Building on this idea, this thesis not only studies key figures in the configuration of new knowledge about the SEP, such as hydrographers, explorers, and naturalists, it also examines the role of previously sidelined actors in the production of knowledge about the SEP and its coastlines, such as sealers and whalers, engineers, geography teachers, and sailors.

Knowledge, as has been argued above, has a spatial component. As geographer John Agnew explains, “knowledge is made as it circulates; it is never made completely in one place and then

simply consumed as is elsewhere”.  

Hence, space and the spatial dimension of knowledge transfer are crucial for understanding how the SEP was integrated into imperial and national narratives in the late-eighteenth and early-nineteenth centuries. Doreen Massey has defined space “as the product of interrelations; as constituted through interactions”. But, what does this mean for the historical analysis of knowledge transfers? I argue that it helps historians to rethink knowledge exchanges in a global framework, allowing us to challenge previous notions of how ideas, knowledge practices, and information travel, shifting the focus to the complexity of knowledge transfer, which is particularly relevant for regions like Latin America. Elaborating upon the findings of postcolonial theorists, Axel Körner has highlighted how “empires constructed spatially-specific hierarchies between notions of citizenship, gender, class, religion and race, in the colonial periphery as well as at home in the metropole”. This acknowledgement affects the way in which knowledge transfer is studied in a multi-cultural context such as the Spanish empire in the eighteenth century and the new Latin American republics in the nineteenth century. As Miller has reflected, “the independent countries of Latin America, evolving both after colonialism and during the rise of neo-colonialism, carried out nation-state-making in the midst of the coalescing global hierarchies of knowledge of the nineteenth century”. In particular, the idea of spatial hierarchies offers the opportunity to re-assess the place of Spanish America in a global context, raising questions about how knowledge is socially validated and acknowledged as such, as well as how it is integrated into transnational networks of knowledge. Furthermore, it allows historians to examine the historical nature of hierarchies of knowledge, understanding them as changing, fluid, and dynamic products of social and intellectual entanglements.

Additionally, this thesis engages with the knowledge fields of geography and hydrography. As a modern empirical science, geography emerged in the long-eighteenth century entangled with the development of Enlightenment ideas, as Charles Withers and David Livingstone have argued. In its origins, “geography was a large and diffuse body of knowledge, encompassing aspects of cartography, topography, surveying and navigation”. In the Age of Revolutions, the distinctions between the fields of hydrography and geography were blurred. According to

Sagredo “both sciences sustained each other”; geographers studied nautical problems and hydrographers also developed geographical studies. This broad and encompassing understanding of geography and hydrography as fields of knowledge continued to be developed well into the nineteenth century. Only by the end of the Age of Revolutions, with the institutionalisation and professionalisation of the different disciplines, did the scope of geography and hydrography become more limited and specialised. In Spanish America, geographic and hydrographic knowledge emerged as an instrument of the colonial government. The creation of geographic and hydrographic surveys was one of the most important tools that the Spanish Empire utilised to exert control over its overseas territories. Similarly to in other regions, the emergence of geography in Spanish America is related to the development of enlightenment ideas in the region. As Nieto has emphasised, geography encompassed subjects as broad as economics, demography, climate, and natural resources, with an instrumental and utilitarian vision of space, nature, and society. Building on this research, this thesis examines how Spanish American individuals utilised geography (and hydrography by extension) as a critical tool that sought the incremental improvement of the SEP and its coastal lands. These fields, then, were comprehended as instruments of reform at the service of the colonial state, and, after the dissolution of the Spanish Empire, they were applied in order to establish the territorial sovereignty of the new republics in the nineteenth century.

Primary Sources

During the eighteenth and early-nineteenth centuries, geographical and hydrographical knowledge and information circulated in both printed and manuscript texts. As aforementioned, this thesis will focus on the knowledge produced by British, Spanish, and Spanish American actors. They actively used printed and manuscript documents to communicate knowledge about the SEP region. For the purpose of this thesis, I will centre on British print primary sources in

113 Sagredo, “De la hidrografía imperial,” 513.
115 Nieto, Orden Natural, 95.
order to understand the ways in which knowledge, images, and ideas about the SEP travelled transnationally, particularly in a context of heightened imperial rivalries. In the cases of Spanish and Spanish American actors, this thesis will work with both print and manuscript texts. Unlike in the British Empire, which had developed a strong printing culture by the mid-eighteenth century, Spain and its colonies mostly used manuscripts to transfer geographical knowledge between a variety of imperial agents. Historiography has long interpreted the scarcity of Spanish printed work about the Pacific as an example of the empire’s supposed backwardness with regards the production of knowledge and scientific activities relating to the region. However, as Buschmann has demonstrated, the use of manuscripts over printed works reflected different ways of understanding empire-building. During the colonial period, especially in the late sixteenth and seventeenth centuries, Spanish imperial authorities were comparatively more protective of knowledge about the Eastern Pacific than other European powers, particularly the Dutch and the British. As Maroto and Parker have explained, Spanish officials largely kept geographical and hydrographical knowledge secret, with documents stored in archives in order to conceal their contents from their competitors. Yet, as print culture expanded in the mid-eighteenth century, Spanish officials also engaged in the creation of printed works about the Pacific. The European publishing industry began to flourish by the mid-eighteenth century. In this context, there was a growing demand for travel writing about the different regions of the world, including accounts of Pacific voyages, several of which became important bestsellers. This research therefore analyses both British and Spanish exploration accounts and their role in the construction of knowledge about the South East Pacific. As Buschmann has argued, the publication battle over the Pacific ultimately was a reflection of different epistemologies of knowledge production. On the one hand, the British used printed works as political tools to undermine the area of influence of the Spanish crown in the Pacific, and to legitimise their commercial, political, and military interest on the region. On the other hand, Spanish officials developed, with limited success, printed accounts to legitimise their alleged dominion over the Pacific, and to validate prior surveys of the region. In particular, I analyse the accounts of mariners, hydrographers, and naturalists usually hired

118 Maroto, *Producing the Pacific*, 74; Parker, “Storing and Sharing Secrets.”
120 Buschmann, *Iberian Visions*, 95.
by the British Admiralty and the Spanish Crown to survey the Southern seas. However, these state-funded actors were not the only ones creating knowledge about the region. As chapter two shows, private actors, namely sealers and whalers, became important agents in the production and circulation of knowledge about the South East Pacific; therefore, their published accounts are also valuable sources of information.

Furthermore, as print culture was consolidated on both sides of the Atlantic world, other kinds of printed documents also started to circulate, transferring new images and representations of world geography. Press notes, scientific reports, and scientific journals contained significant geographical and hydrographical knowledge about the world’s oceans, particularly the remote waters of the South Pacific and its shores. These documents circulated in the Americas and in Europe, becoming important primary sources for studying the circulation of geographical knowledge, particularly during the post-independence period in Spanish America. All in all, the predominance of printed materials and their circulation at the end of the Age of Revolutions showcases the construction of a hierarchy of knowledge, where printed accounts were acknowledged as more valuable than the documents that circulated as manuscripts.

It is important to state that the paucity of Spanish published accounts about the Pacific must not be interpreted as a lack of knowledge. On the contrary, geographical and maritime information and knowledge circulated widely within the empire via manuscript texts. As Rebecca Earle has indicated, manuscripts, predominantly letters, were the backbone of Spanish administrative structure. In particular, knowledge about the SEP circulated among the colonial authorities of the Kingdom of Chile, the Viceroyalty of Peru, and the Spanish metropolis, and sometimes even travelled across the Andes to Buenos Aires and Montevideo. Spanish and Spanish American hydrographers, naturalists, colonial authorities, and military engineers wrote extensive accounts—mostly in the forms of reports, letters, and derroteros (documents containing a set of instructions for finding a course at sea)—detailing their surveys of the region. Moreover, these manuscripts not only included written accounts, but also visual information, mainly in the form of maps. In this vein, it is worth noting that the integration of written and visual texts was not only a feature of Spanish and Spanish American sources, but it was often the way in which geographical and hydrographical information and knowledge was recorded and communicated during the Age of Revolutions. This research, then, draws

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upon both published and unpublished written accounts as well as maps to piece together how knowledge was produced and circulated in the Age of Revolutions.

As Parker has recognised, the integration of maps as primary sources into the history of science in the Pacific region has been limited, particularly for the period prior to the 1800s. Since maps are relatively novel primary sources for history of science research, it is worth dwelling upon the particularities of maps as primary sources. In recent decades, the history of cartography has received renewed attention from historians and cultural geographers alike. J.B. Harley’s seminal text, *The New Nature of Maps*, opened the field to new lines of enquiry by arguing that maps are socially constructed texts. Following this conceptualisation, historians of cartography have currently moved from the study of maps alone to the study of mapping practices. As defined by Matthew Edney, mapping is a “multifaceted set of related practices”, with each practice (surveying, drawing, printing, reading, among others) being shaped by different spatial discourses. In this framework, historical analysis is no longer focused solely on the material object of the map, but on the social practices that enable its existence. As Edney argues, the “production, circulation, and consumption of maps are constituents of social relations, and they need to be studied accordingly”. Moreover, this approach allows historians to concentrate on the ideological and geopolitical conditions of mapping and the material circumstances that frame these processes.

The late-eighteenth and nineteenth centuries constituted the “high age of mapmaking”, where maps were not only practical state tools, but also symbolic statements of power. During this period, the entire globe was subject to intense mapping activities. European empires and the recently independent Spanish American republics mapped the American continent and its shores to generate accurate knowledge of its geographical and hydrographical features. States were the most prominent actors in the production, circulation, and consumption of maps during this period; however, they did not operate alone. Individuals, institutions, and commercial enterprises were also important agents in this multi-layered process. This research concentrates on the different actors working within state agencies, highlighting the role of hydrographers,

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122 Parker, “Pepys Island,” 662.
engineers, and naturalists. In particular, I will analyse their published voyage accounts, and manuscript reports of their exploratory voyages. I also consider actors working outside the framework of the state, such as sealers and whalers, and the medical professionals who joined them on their hunting voyages. I will look into their published accounts in order to analyse the knowledge they produced about the SEP’s geographies and marine faunas.

Furthermore, as print cultures were consolidated across the globe, particularly in Spanish America during the Age of Revolutions, maps became objects that circulated more widely among bureaucrats and the general public, transforming them into valuable sources of information about larger-scale processes such as the territorialisation of empires and nation-states. Following Edney, I understand maps as texts that depict spatial configurations.\textsuperscript{127} There are different classifications of maps which reflect specific functions. Geographical maps depict comprehensive regions such as provinces, countries, regions, continents, and the globe. Most of the cartographical texts that I use for the purpose of this research are charts and plans. Charts “delineate the hydrosphere, for the use of navigation”, while plans delineate delimited geographical spaces.\textsuperscript{128}

Gender as an analytical tool is also crucial for understanding and contextualising the primary sources used by this research. Chapter 5, in particular, addresses gender as a relevant category for the social validation of knowledge. More broadly, though, gendered discourses of science and exploration are paramount for this thesis as a whole. With the notable exception of the British travel writer Maria Graham, most of the actors and knowledge producers studied in this research are men. Activities such as whaling, sealing, as well as navigation and exploration were considered at the time to be masculine enterprises. Furthermore, the explorers James Cook, José de Moraleda, and James Weddell, as well as naturalists such as Claude Gay, Charles Darwin, and Mariano de Rivero, all saw themselves as “men of science” as well as “men of action”, whose mission was to unveil the ‘mysteries’ of nature and explore the ‘unknown’ corners of the world. These men contributed greatly to the concept of the “heroic field naturalist, the ‘naturaliste-voyageur’, whose success depended upon bravery and strength, as much as intelligence, skill, and knowledge”.\textsuperscript{129} Thus, gendered visions of science, particularly in the field, shaped their performances as explorers and men of science. As Dorinda Outram

\textsuperscript{127} Edney, \textit{Cartography. The Ideal}, 41.
\textsuperscript{128} Edney, 3.
\textsuperscript{129} Schell, \textit{The Sociable Sciences}, 56
summarises, “field natural history was closely associated with a particular approach to nature, as well as with ideals of heroic, manly endeavours”\textsuperscript{130}

Even though this research focuses on British, Spanish, and Spanish American primary sources, it is important to highlight that they were not the only powers involved in the transnational production of knowledge about this seascape. That said, they were the most important actors during the Age of Revolutions. French and Dutch explorers were also engaged in the construction and circulation of knowledge about the SEP. Dutch explorers were particularly important for the construction of nautical knowledge and mapping in the seventeenth century.\textsuperscript{131} French explorers also engaged actively with the Pacific region.\textsuperscript{132} Nevertheless, their impact on the production of geographical and cartographic knowledge was limited when compared with the impact of British knowledge.\textsuperscript{133} More importantly, as the French and Spanish crowns were close allies throughout much of the 1700s, including in many of the wars of imperial dominion during the second half of the century, French incursions into the Pacific were far less threatening for the geopolitical agenda of the Spanish Empire.\textsuperscript{134} Furthermore, as Buschmann explains, geographical information gathered by French explorers was often shared with Spanish officials.\textsuperscript{135} United States actors were also becoming increasingly active in eastern Pacific waters during late-eighteenth and early-nineteenth centuries, as Igler has demonstrated;\textsuperscript{136} however, the impact of their surveys on the geographic, hydrographic, and cartographic knowledge about the region did not become significant until the second half of the 1800s.\textsuperscript{137} In writing this thesis I have therefore chosen to focus specifically on representations generated by the British and Spanish actors, as well as Spanish Americans, showcasing also – insofar as the sources allow -- the role of local and indigenous actors in these enterprises.

\textsuperscript{131} According to Elizabeth Montanez-Sanabria and Ximena Urbina, “The Dutch achieved a significant corpus of knowledge about the “southern lock,” but after their failed projects in the viceroyalty of Peru they focused on their possessions in the East Indies”. Montanez-Sanabria and Urbina, “The Spanish Empire’s Southernmost”, 730. See also Parker, “Storing and Sharing Secrets”; Fernández-Armesto, \textit{Pathfinders}, 263–64.
\textsuperscript{132} Montanez-Sanabria and Urbina, “The Spanish Empire’s Southernmost,” 730.
\textsuperscript{133} Hélène Richard has remarked that the exploration voyage of Louis-Antoine de Bougainville “did not have a great impact upon cartography and geography, but it did reignite interest on the part of France and the king in distant exploration”. Hélène Richard, “The Interest of French Cartography in the South Pacific in the Eighteenth Century,” \textit{The Globe}, no. 83 (2018): 15.
\textsuperscript{134} See Guerra Moscoso, “George Anson’s Voyage,” 224.
\textsuperscript{135} Buschmann, \textit{Iberian Visions}, 116.
\textsuperscript{136} Igler, \textit{The Great Ocean}.
\textsuperscript{137} See Valdés et al., “Alcances naturalistas.”
Outline

This thesis is divided into five chapters that engage with different themes related to the process of knowledge production and circulation, the institutionalisation and specialisation of science, and empire and state formation in Latin America. Each chapter a specific chronological focus in order to bring these processes together and to illustrate the effects of the transition from colony to nation, and change and continuity in the production of knowledge about the SEP and its coastlines. Chapter 1, 2, and 3 specifically address the production and circulation of knowledge about the SEP’s waters, coastal lands, and islands, emphasising the creation of hydrographic and geographic knowledge. These chapters explore the idea of knowledge as a tool for empire and nation building as well as a vehicle for imperial competition.

Chapter 1, ‘Geographies of the unknown’, introduces the SEP as a little-explored maritime region that became an important scenario for imperial rivalries in the mid-eighteenth century. It explores how the SEP was incorporated into Spanish and British imperial geographic systems in the period between the 1740s and 1770s. In order to do so, this chapter adopts Carla Lois’s concept of the geographies of the unknown, which combines the construction of knowledge about real physical spaces with that of imagined and projected spaces. I start by examining how the British expedition led by George Anson in the early 1740s triggered an inter-imperial competition between Britain and Spain for knowledge about the SEP. Unlike prior British explorations and privateering voyages, such as those conducted by Woodes Rogers and George Shelvocke in 1708 and 1719 respectively, Anson’s expedition in general, and his voyage account in particular, transformed geographic and hydrographic knowledge into a vehicle for imperial rivalries. The first section of this chapter examines the knowledge and geographical images produced by Anson’s expedition. The chapter then moves to the Spanish and Spanish American activities in the aftermath of Anson’s enterprise, examining the various ways in which imperial and local actors generated new in-situ knowledge about the SEP. By doing so, this chapter also explores the collective character of knowledge enterprises in Spanish America, emphasising the role played by indigenous and local actors in the production of knowledge about the SEP, decentering narratives about the production of Pacific knowledge, and highlighting the ways in which imperial European knowledge was, in some cases, built upon indigenous spatial networks. By analysing the cases of the cases of the Falkland, Pepys, and Aurora Islands, the final section of this chapter explores the imagined geographies of the SEP to emphasise the importance of geographical imaginations for the competing representations and knowledge of this maritime region in the mid-1700s.
The second chapter complicates the picture of who produced knowledge about the SEP in the Age of Revolutions by introducing new actors: British whalers and sealers. In particular, this chapter examines how by the late eighteenth and early nineteenth centuries, these actors created informal knowledge communities that generated empirical knowledge about the SEP’s navigation and its coastal geographies. It also examines the ways in which sealers and whalers produced new images of the sea, understanding it as a space of exploitation and profit. Moreover, by analysing the creation of local hunting and fishing enterprises in the late-colonial and early-national periods, this chapter explores the impact of the commodification of the SEP in Spanish American views of this marine environment. Lastly, the focus moves to the contribution of whaling to natural history and the production of Spanish American knowledge about local fauna. In particular, it analyses the role played by medical professionals on board whaling vessels in the gathering of knowledge about southern whales, particularly Juan Ignacio Molina’s work on SEP whales, exploring how this research challenged established conceptions about the degeneration of nature in the Americas.

Chapter 3 returns to imperial rivalries, addressing the geopolitics of knowledge and the changes that occurred in the Age of Revolutions between the late 1780s and the early 1840s. In particular, this chapter explores how hydrography was a vehicle for interstate competition between Spain and Britain, and a tool for nation-state building in Spanish America in the early republican period. The first section focuses on imperial competition between the British and Spanish Empires with regards the production of knowledge about the SEP, analysing the cases of the hydrographic expeditions conducted to the southern passages that connect the Pacific with the Atlantic oceans between the 1780s and the 1830s. This section highlights the efforts made by the Spanish imperial authorities to produce new knowledge about the connecting maritime passages in order to politically and symbolically control this region. It further frames the British hydrographic enterprises of the 1820s and 1830s in relation to the rise of Britain as a global power that sought knowledge in order to control the world’s strategic navigational routes. The second section moves to Spanish America, examining how imperial competition incentivized the emergence and production of Spanish America-based knowledge about the SEP. It argues that by the late 1700s, the colonies had created a corpus of locally-generated knowledge about the sea and its coastal lands, also creating their own knowledge institutions. Finally, this chapter raises questions about the political importance and impact of this locally-generated knowledge after the demise of the Spanish Empire. By analysing the cases of the first hydrographic expeditions conducted by the Chilean Navy during the 1830s and 1840s, this
Chapter explores the local capabilities and scientific institutions that made the development of these early republican scientific enterprises possible. By doing so, the thesis contributes to historiographical discussions about change and continuity between the colonial and national periods in Spanish America following the dissolution of the Spanish Empire and the emergence of republican regimes.

Chapters 4 and 5 move away from coastal waters to focus on geographical and geological knowledge of the SEP’s coastal lands. With a focus on the SEP’s terrestrial spaces, these chapters further explore change and continuity from colony to republic and the role and place of Spanish American knowledge in the new global scenario of the 1820s and 1830s. Chapter 4, ‘Nationalising geographies’, shifts our attention away from imperial rivalries, and focuses on the production of local and regional knowledge about the SEP. Although imperial competition remains the political framework of this chapter, it explores how colonial and later republican actors produced relevant geographic knowledge about the SEP’s coastal lands and islands, further engaging with the discussion of change and continuity in the Americas after the dissolution of the Spanish Empire and the emergence of the new political regimes set in the previous chapters. It uses the construction of geographical knowledge about Chile’s coastal lands in the eighteenth and early-nineteenth centuries to argue that systematisation of Chilean territorial knowledge can be traced to the late-colonial period. In order to do this, the first section examines the role played by colonial bureaucrats and military engineers in the creation of local geographic and cartographic knowledge about Chile’s islands and coastline. Section two then moves to the early republican period, examining how knowledge about the SEP’s coastal lands and islands was produced and what images were created in the first decades of the republican regime in Chile. This section in particular examines the first geographical surveys of the 1820s and 1830s, as well as press articles and school geography textbooks. Using this array of sources, I argue that early geographical research and national imagery were drawn from earlier colonial representations.

Finally, Chapter 5 widens the lens of this thesis by exploring the role and place of Spanish America-based knowledge at the end of the Age of Revolutions. By studying the case of geological knowledge about the SEP’s coastal lands, this chapter analyses how Spanish American knowledge was socially validated in the new political scenario of the 1820s and 1830s after the demise of colonial structures and the rise of Britain as a hegemonic global power. In particular, it focuses on the transnational debate on the effects of earthquakes in land elevation after the seismic events in Chile in 1822 and 1835, exploring two main ideas. First,
it examines how the Chilean coastal lands became transnational testing grounds for geological theories in the early-nineteenth century. Second, it explores how social features such as place, gender and a scientist's personal connections affected the validation of scientific knowledge. By doing so, this chapter addresses the social dimension of science-making, highlighting the asymmetries of power in knowledge circulation in global scientific networks at the end of the Age of Revolutions. It offers an invitation to think more broadly about the place of local knowledge production in Spanish America after the changes brought about by the Age of Revolutions during the 1820s and 1830s.
Chapter 1: Geographies of the Unknown: The incorporation of the South Eastern Pacific into competing knowledge systems (1740s-1770s)

In March 1750, a small crew commanded by Manuel Brizuela set sail from Chiloé to survey Inche Island, one of the hundreds of islands located in the Western Patagonian channels. Brizuela’s expedition was ordered to survey these channels in search of British vessels or settlements. The Spanish Crown believed that the British government was organising a new expedition to set up a colony in the South Pacific, either on Juan Fernández Island or on the remote Inche Island. In spite of the hardships imposed by the adverse weather conditions, the small crew formed by Spanish American and indigenous sailors took possession of the island in the name of the Spanish King and built a fort. The crew also explored, surveyed, and mapped the island and its surroundings. When they returned to Chiloé, Brizuela filed a report to the local authorities describing the geographical and hydrographical features of the region. In addition, he included three maps of the Island that portrayed the shape of the bay, the landform of the island, and data relating to the depths of its coastal waters. Historians have paid attention to the economic, political, and military aspects of the imperial competition over the control of the Pacific during the Age of Revolutions; however, far less has been said about the production of knowledge about this region and how it impacted the imperial rivalries of the mid-eighteenth century. In the same vein, very little attention has been given by historians to the production of Spanish American knowledge of the Pacific shores. Nevertheless, it had been customary since the early colonial period to instruct Spanish officials based in the colonies to patrol and survey the waters and coastal lands of the Eastern Pacific. In particular, as the case of Brizuela shows, Chiloé Island officials took on the exploring and surveying of the little known-waters of the Patagonian channels. By analysing the case of the SEP, this chapter argues that the production of geographical accounts, coastal maps, and hydrographic charts

138 See, Williams, The Great South Sea; Matsuda, Pacific Worlds; Chaplin, “The Pacific before Empire”; Bashford, “The Pacific Ocean.”
139 Notable exceptions are: Maroto, Producing the Pacific; Buschmann, Iberian Visions, and recently Padrón, The Indies of the Setting Sun.
was more important for imperial competition and empire-building than has been previously argued, highlighting the transnational nature of the actors involved. That said, this chapter also recognises that this process was far from straightforward, especially since the criteria for what constituted geographic and cartographic knowledge were becoming more specific and specialised. Further, material and environmental conditions also played an active role in the construction of knowledge about this maritime region.

During the colonial period, the coastal waters of the SEP had been little explored. In particular, the rugged coast of Western Patagonia, the waters surrounding Cape Horn, and the straits of Magellan and Le Maire, as well as the adjacent islands of the Chilean coasts, remained insufficiently studied and mapped. However, by the mid-eighteenth century, the increasingly intense competition among the European seaborne empires, especially between Spain and Britain, made the scarce geographical knowledge of this region all the more valuable. The Spanish empire had politically and symbolically controlled the Eastern Pacific since the early sixteenth century following the colonisation of South America and the establishment of its monopoly over maritime trade. Yet this dominance was challenged by the sporadic presence of Dutch, French, and British naval and privateering expeditions during the seventeenth and early eighteenth centuries. By the mid-1700s, however, Britain’s challenge to Spanish dominion in the Pacific became more aggressive. The military expedition conducted by commodore George Anson (1697-1762) in the early 1740s marked the beginning of British military and exploratory enterprises in the Pacific region. As Glyn Williams has observed, Anson’s enterprise “represented the beginning of more ambitious British designs in the Pacific”, triggering a competition between Britain and Spain for knowledge and control of the SEP.

This chapter explores the process of knowledge production about the SEP between the 1740s and 1770s. It examines how this southern seascape was incorporated into Spanish and British imperial systems of geographical knowledge. As Katherine Parker has remarked, geographic knowledge about the South Atlantic and Pacific oceans was a scarce and valued commodity among the different European actors. The end of the Seven Years War (1756-1763) has been identified by historians as an important milestone for European exploration and the production of geographic and ethnographic knowledge about the Pacific Ocean. In the second half of

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141 Williams, *The Prize of All the Oceans*, xviii.
142 Parker, “Pepys Island,” 668.
the 1760s and the 1770s, there were several expeditions that circumnavigated the world and surveyed the little-explored waters of the Pacific Oceans. The voyages of John Byron (1764-1766), Samuel Wallis and Philip Carteret (1766–1769), Louis- Antoine de Bougainville (1766–1769), and James Cook’s three expeditions (1768-1780) generated relevant knowledge about the Pacific region as a whole. However, the SEP had actually been the subject of knowledge production earlier than other areas in this oceanic region. George Anson’s endeavours triggered an important process of knowledge production and circulation, which was accelerated in the 1760s after the end of the Seven Years War, and the organisation of more aggressive Pacific exploration by the British Admiralty.

Anson’s maritime adventure had important military and political repercussions in the Eastern Pacific. Sabrina Guerra Moscoso has demonstrated how Anson’s expedition revealed the chronic fragility of Spanish defences in the entire Pacific region. According to her, Spain had relied on the difficult geography of the SEP to act as its main defence since the sixteenth century. The Spanish believed that hazardous navigation through the southern passages and the harsh environmental conditions of the SEP coastal regions and islands were enough to discourage any attempt to navigate and/or settle in this region. Anson’s voyage, on the contrary, demonstrated that even though the navigation from the Atlantic to the Pacific Ocean was difficult, once the vessels managed to make it to the Western side of South America it was relatively easy to anchor and to create a provisional settlement in this area. Another repercussion of Anson’s enterprise was the publication of geographic and cartographic knowledge about this region. His adventure and experiences, as well as those of several of his crewmembers, were published, circulating widely across the Atlantic world. These books contained relevant and strategic knowledge about how to navigate the southern passages, as well as details of the hydrography and geography of coastal places along the SEP coast. The publication of this new knowledge had important consequences for the Spanish Crown, which in response ordered the organisation of several expeditions to explore and survey different areas of the little-known geographies of the SEP.

Yet, the interest of the imperial powers in acquiring geographic knowledge about the SEP collided with the material and environmental conditions of this space, particularly in the southern passages that connected the Atlantic with the Pacific oceans and the adjacent islands.

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145 Guerra Moscoso, 220.
146 Torres, “Un Bestseller”
on the Chilean coast. Since the late sixteenth century, the geographical imagination of these maritime places had been characterised by the harsh environmental conditions, with narratives that emphasised the constant tempests, shallow harbours, and violent winds and tides. Francis Drake’s narrative, for example, famously described the sea in his passage from the Atlantic to the Pacific waters as *Mare furiosum*. These images of the SEP endured in voyage accounts throughout the seventeenth and eighteenth centuries. The 1773 published account of the British captain Samuel Wallis is an eloquent example of the latter. He drew a very dramatic depiction of the navigation through the southern passages: “Thus we quitted a dreary and inhospitable region, where we were in almost perpetual danger of shipwreck for near four months (…) a region where, in the midst of summer, the weather was cold, gloomy, and tempestuous, where the prospects had more the appearance of a chaos than of Nature”. Moreover, the wild, untamed and little-known nature of this region facilitated the emergence of fantastical myths, such as those of the Patagonian giants and the fabled City of the Caesars, and imagined geographies such as the Pepys and Aurora Islands. Indeed, these mythical geographies had been associated with Patagonia ever since the Magellan circumnavigation (1519-22) passed through the region, the first European voyage to do so. These fantastic myths and geographical imaginations were particularly relevant for the cartographic depiction of Patagonia, transforming this region into a ‘terrifying land’, an antipodes of the geographies of the northern hemisphere. As Fernanda Peñaloza has explained, during the early modern period, “Patagonia embodied powerful images that so easily appear to convey the monstrous, the uninviting, the alluring, the unexpected”. By the mid-eighteenth century, these imagined geographies existed in contention with real and empirical knowledge about this maritime region.

147 Francis Drake and Francis Fletcher, *The World Encompassed by Sir Francis Drake: Being His next Voyage to that to Nombre de Dios; collated with an unpublished Manuscript of Francis Fletcher, Chaplain to the Expedition; with Appendices Illustrative of the Same Voyage, and Introduction* (London: Printed for the Hakluyt Society, 1854), 82.
In order to explore how the SEP was integrated into the knowledge systems of the British and Spanish Empires, this chapter will adapt Carla Lois’s concept of ‘geographies of the unknown’.153 This notion reconciles and emphasises the importance of both the real and the imagined in the construction of spatial representations and knowledge about this particular maritime region. The unknown, as a geographic category, is not a space that has not been discovered at all, but rather a space that has been insufficiently explored and surveyed. According to Lois, one of the main features of the geographies of the unknown (terrae incognitae) “is its (in)accessibility”.154 The difficulty of rapid and direct access to these places impacts upon the cultural perception and depiction of them, shaping the ways in which these places are integrated into known and fully experienced geographies. For Lois, the geographies of the unknown encompass depictions that entangle images from nature with geographical representations of envisaged and imagined spaces.155 The scarcely known region of the SEP in the mid-eighteenth century, can thus be framed as a geography of the unknown. The rugged coasts of Patagonia and Tierra del Fuego, with their shallow waters and unruly winds, combine with intense tides, the presence of icebergs and coastal ice sheets, made this space extremely difficult to navigate, and survey. Furthermore, tales of human tragedy caused by shipwrecks and narratives that emphasised the complete otherness of the local inhabitants, i.e Patagonian giants and the mythical lost City of the Caesars, evoked both fantasy and fear, tinging the representations of this space with fantastic ideas. The geographies of the unknown illuminate the different ways in which the maritime space of the SEP, namely its islands, coasts, and navigational routes, were interpreted and incorporated into Spanish and British geographical discourses. Existing historiography has focused on the progress made by European navigation in the area from the mid-1700s onwards, emphasising how previous geographical imaginations were dismantled as European empires surveyed and mapped these southern shores. The geographies of the unknown challenges this linear and progressive interpretation. It allows me to examine how British and Spanish imperial actors created new knowledge about the real and experienced geographies of the SEP, while, at the same time, reinforcing previous imagined representations and projecting new ones.

Likewise, by using the notion of the ‘geographies of the unknown’ the chapter draws attention to the SEP, particularly to the shores of Patagonia and Tierra del Fuego and their adjacent

154 Lois, 17.
155 Lois, 19.
islands, highlighting how this area emerged as a contested space, becoming more relevant for the imperial projects than hitherto has been acknowledged by the existing scholarship.\textsuperscript{156} Imperial actors of the Spanish and British Empires were interested in this area as it was conceived as strategic space for global navigation; they, in turn, explored, surveyed, and published new knowledge to unveil the mysteries of this little-known geography to incorporate it into their imperial knowledge systems. Furthermore, this notion gives agency to the environment, recognising the importance of the natural setting and the material conditions for the production of hydrographic and geographic knowledge.

This chapter is divided into four sections. The first section examines the ways in which George Anson’s military enterprise fuelled the rivalries between Britain and Spain for dominance over the Pacific region in the 1740s. In particular, it explores how Anson’s enterprise transformed geographic knowledge of the SEP into a vehicle for imperial competition. Section two focuses on the Spanish responses to Anson’s naval expedition. It examines the case of Jorge Juan and Antonio Ulloa’s voyage of exploration and the relevance they attached to developing in-situ and empirical knowledge about the SEP. The third section highlights the contribution of Spanish American expeditions to the knowledge of the Western Patagonian channels in the mid-eighteenth century, elaborating upon the collective character of these knowledge enterprises and the role played by indigenous actors. The final section explores the imagined geographies of the SEP in order to emphasise the importance of geographical imaginations for the competing representations of the SEP. To do so, this section analyses the cases of the Falkland, Pepys, and Aurora Islands.

**Expeditions from Britain**

Commodore George Anson’s military enterprise to the Pacific (1739-1741) changed the way in which the SEP was depicted and envisaged. The knowledge produced and published by the crew became an instrument of imperial competition between Britain and Spain’s maritime dominion over the Pacific. Anson’s maritime enterprise originated from the increasing tensions between Spain and Britain in the midst of the War of Jenkin’s Ear (1739-1748). It was designed as a formal naval expedition to attack Spanish possessions in the Pacific; however, it ended up

\textsuperscript{156} Juan Alfonso Maeso, *Expediciones Navales Españolas a la Patagonia Argentina durante el siglo XVIII* (Madrid: Ministerio de Defensa, 2007).
adopting the traditional privateering practices of previous British-sponsored enterprises. Notably, Anson’s expedition marks a transitional moment in British maritime expeditions between the privateering missions of the late sixteenth-early eighteenth centuries, and the formal naval and scientific expeditions of the 1760s onwards. Moreover, Anson’s voyage account (1748) has been recognised as one of the most important travel narratives of the eighteenth century, characterised as a best-seller that was widely read and translated into several European languages. The account depicted the adventures and misfortunes of Anson’s six war-vessel fleet. The extraordinary events that took place during the circumnavigation and the emphasis on the description of remote lands led the writer of the account, Richard Walter, to present the enterprise as a discovery and adventurous enterprise, focusing more on the new knowledge it included about the Pacific region, and less on the privateering efforts of the crew. As chaplain of the H.M.S Centurion, Walter had access to Anson’s documents, which allowed him to compile knowledge and information from these papers. By doing so, Walter gave a voice to Anson’s views on the Pacific. In particular, the account highlighted the importance of developing new knowledge about the geographies of the SEP, fuelling, in turn, an inter-imperial competition between Spain and Britain for knowledge and political influence in the region.

Anson’s narrative engaged with traditional ways of depicting nature and the navigation through the SEP’s waters. In his passage from the Atlantic to the Pacific oceans, for example, the account emphasised how harsh the weather and environmental conditions were, depicting the region as savage and gloomy, evocating similar images as Drake with his Mare furiosum. This negative image of the SEP’s environment was a recurrent theme during the Early Modern period. In Anson’s narrative, however, the focus on the hardships endured by the crew was used to highlight the prowess of their endeavours, portraying their navigation as an epic

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157 Peter Bradley, *British Maritime Enterprise in the New World. From the Late Fifteenth to the Mid-Eighteenth Century* (Lewiston: The Edwin Mellen Press, 1999), 530.
158 See Williams, *The Great South Sea*; Bradley, *British Maritime Enterprise*; Chaplin, “The Pacific before Empire.”
159 Torres, “Un Bestseller”
160 Anson’s fleet encountered successive disasters in their navigation towards the South Sea. Two of the vessels were not able to surmount the hardships of the navigation round Cape Horn, returning home; meanwhile, the H.M.S Wager wrecked on the coasts of Western Patagonia, suffering great casualties, mutiny, and the separation of the crew. Moreover, of the remaining three vessels, only one was able to be repaired and refitted in order to continue the navigation across the Pacific with a sick and weak crew.
162 Richard Walter, *A Voyage Round the World in the years MDCCXL, I, II, III, IV. By George Anson, Esq; Commander in Chief of a Squadron of His Majesty’s Ships, Sent upon an Expedition to the South Seas* (London: John and Paul Knapton, 1748), 75.
narrative of men versus the wild forces of nature. Moreover, the account stressed this point by highlighting the way in which the conditions of the crew were worsened by another nonhuman agent in particular: diseases. The account created a dramatic picture of the health and sanitary conditions inside the vessels as a consequence of scurvy and other illnesses, which ultimately decimated the crew.\textsuperscript{163} In spite of the severe adversities that they encountered, Anson depicted the SEP as a space of great possibilities for British navigation and imperial projects. His experience taught him that even though the navigation from the Atlantic to the Pacific Oceans was difficult, there were key places along the Patagonian coast and several Chilean islands to safely anchor and recover from the strenuous navigation, making the transoceanic maritime passage possible and more secure. In order to support this claim, Anson’s account included a detailed description of the hydrography and geography of the region. Departing from previous narratives that solely focused on the adventures and perils of the voyages, Anson’s narrative combined this “with an astonishing degree of empiricism”, as Buschmann has argued.\textsuperscript{164} Crucially, \textit{A Voyage Round the World} represents a turning point in the production of knowledge about the SEP, transforming the geographic and hydrographic information and knowledge into a crucial element of the narrative.

The production of detailed knowledge about the Pacific Ocean and its coasts was seen as an important element in the legitimization and social validation of Anson’s published account. It was argued that the available knowledge about the region was both limited and lacked credibility. Following a similar pattern of previous British voyage accounts, namely William Dampier’s \textit{New Voyage round the World} (1697), Anson’s account emphasised the importance of publishing the new geographic information that had been gathered and recorded. In the introduction to \textit{A Voyage Round the World}, the editor, Walter, argued that the Spaniards had taken the greatest care in maintaining “secreted[away] all accounts of their voyages from the rest of the world”.\textsuperscript{165} This claim addressed important ideological features of British travel narratives and geographical accounts about the Pacific. British maritime enterprises were presented as superior because of their liberal values of openness and commitment to the dissemination of knowledge, while Spanish maritime enterprises were characterised as secretive, and therefore, backwards. Writing for a British readership, the emphasis given to the publication of geographic and cartographic material had the objective of delegitimising Spanish

\textsuperscript{163} Walter, 100, 104.
\textsuperscript{164} Buschmann, \textit{Iberian Visions}, 101.
\textsuperscript{165} See introduction. Walter, \textit{A Voyage Round World}, n/p.
influence in the Pacific region, reclaiming it as a transnational space. Similarly, the lack of published knowledge was presented as a handicap for the security of transoceanic navigation.\textsuperscript{166} Moreover, in a period of expanding print markets and book culture, the publication of geographic knowledge was critical for imperial projects. According to Walter, the acquisition of precise and accurate knowledge about how to navigate the Southern Seas would prompt the extension of British commerce and power.\textsuperscript{167}

The idea of the instrumentality of knowledge was a crucial component in Anson’s narrative. Earlier accounts had also provided important sources of information about the navigation of the South Seas by recording their routes and integrating cartographic and geographic information.\textsuperscript{168} However, the publication of Anson’s voyage account shows a deliberate effort to describe, record, and propose new and more efficient ways of navigating across the globe. Anson paid especial important attention to describing the best way to navigate through SEP waters. The unknown geographies of the SEP represented a hazard to transoceanic navigation, as European mariners did not have accurate knowledge of the sea and its coastline. According to Anson, these hazards and risks could be avoided by studying and recording the best navigational route. His empirical knowledge of the region based on observations and the recording of the geographical and hydrographical features, as well as the study of the routes followed by previous voyages enabled him to create new knowledge about the best way to traverse from the Atlantic Ocean to the Pacific Ocean.\textsuperscript{169} Commodore Anson contended that ships bound for the South Seas should not pass through the Strait of Le Maire as was customary, but instead navigate eastward around Staten Island and then move further south, until they reached the latitudes 61 or 62 degrees South, where they should turn westward.\textsuperscript{170} These directions aimed to make navigation easier and more secure, avoiding the strong winds and currents present in the southern seas, and therefore, lessening the possibilities of a wreck. Furthermore, Anson’s account presented new knowledge about the navigation of the southern passages, which was “diametrically opposite to those formerly given by other writers”.\textsuperscript{171} By presenting these directions, Anson created a new route that encouraged the navigation through open waters, changing the knowledge about how to navigate the dangerous waters of the SEP.

\textsuperscript{166} Introduction. Walter, n/p.
\textsuperscript{167} Introduction. Walter, n/p.
\textsuperscript{169} Walter, \textit{A Voyage Round the World}, 86.
\textsuperscript{170} Walter, 86.
\textsuperscript{171} Walter, 87.
The account provided new and instrumental knowledge about the coastal geographies of the SEP. In particular, the narrative developed detailed descriptions about places to anchor safely and refresh the crew. After months of navigation from Europe, anchoring was a strategic matter, especially among the little-known geographies of South America’s southernmost tip. The coasts of the SEP had limited places where this could be done safely. The Western Patagonian shores, for example, could provide resources—namely water, wood, and a few refreshments—; however, it was considered a very difficult environment in which to seek harbour. Other places, like Chiloé and Mocha Islands, were signalled by previous accounts as having good havens to anchor and refresh, but they represented an important risk since they were Spanish-occupied islands. Instead, Anson’s experience presented and validated the Juan Fernández Islands, situated 670 km off the Chilean coast, as the best place to refresh the crew after the extenuating passage from the Atlantic Ocean to the Pacific Ocean. The account dedicated an entire chapter to describing their main geographical and hydrographical features, including the form of the bay and its main resources. The aim was to generate practical knowledge about the Southern American coastal lands and islands, in order to use them as staging post in the transoceanic navigation from the Atlantic to the Pacific Oceans.

Drawings and maps were integrated to reinforce the idea of instrumental knowledge, as they were used as tools for better understanding these remote geographies. For example, along with the description of the geography of Tierra del Fuego, Anson’s account incorporated a drawing of its shore to facilitate correct navigation in this region. The account argued that “this drawing will hereafter render it impossible for any ships to be deceived in the manner abovementioned, or to find any difficulty in distinguishing the points of land by which the Streights are formed”. The drawing was intended to correct previous information that did not accurately depict the region, which resulted in accidents and unnecessary navigational hazards. Drawings were considered practical information, necessary for the accurate depiction of these dangerous shores, which helped to reveal the unknown geographies of the SEP. Indeed, the inclusion of visual material gave legitimacy to Anson’s enterprise, as it was portrayed less as a privateering enterprise and more as an exploratory and knowledge-producing venture, as Buschmann has suggested.

172 Walter, 69.
173 Walter, 74.
Anson’s new knowledge was thus transformed and coded into cartographical knowledge. The published account included several maps that depicted the geographical and hydrographical features of the surveyed areas. The map titled “A Chart of the Southern Part of South America” (Fig. 1.1) was presented as ‘the most correct map hitherto published’.

It was argued that previous maps carried important errors that were necessary to rectify. Anson’s chart presented new cartographic information about key stopping off places such as Cape Blanco - in Eastern Patagonia-, Staten Island and the Eastern side of Tierra del Fuego. It also rectified the location of relevant maritime regions such as Le Maire Strait and the position of the Brazilian coast. Similarly, it introduced some changes to previous features of the Western Patagonian geography by using the information provided by members of the fleet that had been wrecked on this coast. In addition to this new information, the map featured the route followed by Anson’s vessel Centurion, which included the path followed by the vessel, and a second path signalling the route resulting from the calculations of the deviations occasioned by the currents. By including this data, the mapmakers emphasised the accuracy of the hydrographical knowledge produced by Anson’s expedition.

The account also included maps of places in the SEP that had never been depicted before. This is the case of the map of Inche Island (Fig. 1.2) located in the middle of the Patagonian channels. As can be seen, the map included standard elements such as the location of the island, as well as information about its main bay and harbour, and the fathoming of its coast. To produce this map, the editor used the data provided by members of the Anson fleet who were involved in the wreck of the Pink, particularly the sketches drawn by the crew’s Master and Surgeon. The publication of this map is significant because it incorporates the depiction of this island for the first time in European cartography, as it was considered necessary to have precise knowledge of where to anchor in case of an emergency after passing around Cape Horn. The wreck of the Anna provided the opportunity to produce knowledge about this hitherto uncharted geography. Despite discouraging navigation through the interior channels of Western Patagonia, Anson’s voyage narrative incorporated Inche Island, particularly the bay that they called Anna Pink, into the geographies of the SEP, acknowledging it as a space where it was safe to refit the vessels and to refresh the crew in case of an emergency. With these maps,

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175 Walter, A Voyage Round the World, 95.
176 Walter, 96.
177 Walter, 95–97.
178 The map was drawn from the information of the Wager’s crew. Walter, 95–96.
179 Walter, 96.
180 Walter, 141.
the British not only produced a clearer picture of the hazardous waters of the SEP, showing how to navigate through it, they also mapped places that were still unknown to Europeans, thus, unveiling the mysteries of the region’s complex geography.

Fig. 1.1. *A Chart of the Southern Part of South America* (1748)

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181 Walter, *A Voyage Round the World*. 
Anson’s account gave importance to previously peripheral places in the South Pacific. Such was the case with the Juan Fernández Islands. As has been previously mentioned, these unoccupied islands had been used as a haven for British buccaneers and privateers during the seventeenth and early eighteenth centuries. In the mid-1680s, Bartholomew Sharp’s privateering expedition drew attention to the Juan Fernández Islands as a refitting location for transoceanic voyages. The following expeditions of John Strong, William Dampier and Basil Ringrose in the 1690s and early 1700s further stimulated the geographical imagination of Juan Fernández as a crucial place in the navigation from the Atlantic to the Pacific Oceans. However, the role of the islands as a safe haven “was pushed to new heights” with Anson’s voyage account, as Williams has recognised. Anson’s account praised the group of islands as “the only commodious place in those seas, where the British cruisers can refresh and recover

182 Walter.
183 See, Benjamín Vicuña Mackenna, Juan Fernández. Historia Verdadera de La Isla de Robinson Crusoe (Santiago de Chile: Rafael Jover, 1883).
184 Williams, The Great South Sea, 232.
their men after their passage round Cape Horn”. After their terrible navigation through the southern transoceanic passage, Anson’s crew used this island to recover and refit their vessels. He instructed the survey of the main Island of Juan Fernández and the smaller island, Más Afuera, “knowing, from his own experience, of how great consequence these materials might prove to any British vessels hereafter employed in those seas”. The account also incorporated maps of the islands. The chart of the North-East side of the island (Fig. 1.3) was designed to provide practical information about the main island of Juan Fernández, highlighting the fathoms of its most important harbour. This map, along with the description of its geographical features and several drawings of the islands, was conceived as useful information, being especially beneficial for British navigation and future commercial and political projects in the Pacific region. These new depictions gave the Juan Fernández Islands a particularly important place in the British geographical imagination of the SEP. They reinforced Anson’s depiction of the Pacific as they portrayed this ocean and its islands as a contested space, opened for British imperial ambitions.

Fig. 1.3. A Survey of the North East Side of Juan Fernández Island in the South Sea (1748)

185 Walter, A Voyage Round the World, 114.
186 Walter, 114.
188 Walter, A Voyage Round the World.
Anson’s account recommended further expeditions to the region, both to the South Atlantic and the South Pacific. It was argued that since Great Britain possessed the most powerful naval force, it had the capabilities of making new discoveries and extending navigation for the good of “mankind”, reinforcing the idea of British superior values of public and open knowledge.189 In the South Atlantic, the uncharted Falkland Islands and the imaginary Pepys Island, as well as Tierra del Fuego and Staten Island, were regarded as key places to conduct surveys for the improvement of British navigation. On the Pacific side, the West coast of Patagonia, from the Magellan Strait to the Chilean settlements, was considered an important coastline to examine. These places were regarded as geopolitically significant since knowledge of their geography could be beneficial for commencing commercial trade with the “Araucanos and other Chilean Indians”.190 Since the voyage of British naval commander John Narborough (1669-1671), it had been believed that these Indian communities would buy arms and make alliances with the British to fight against the Spanish.191 Narborough’s voyage was the first expedition in a series of British privateering excursions to the Pacific region in the late seventeenth century. Along with the voyage accounts of Sharp (1699) and the already-cited Dampier, Narborough contributed greatly to British imperial projections in the SEP.192 Anson’s account further reinforced these beliefs, particularly in regards to trade and political alliances with local people. He argued that correct knowledge of these coasts would empower the commercial and political interests of the British against the Spanish Empire in South America, furthering the competition between the empires.193

In 1749, Anson and several Admiralty officials created a plan to further explore the SEP. The idea was to organise an expedition to locate the Pepys and Falkland Islands, and to carefully and survey and chart the Patagonian coasts and Juan Fernández Islands in detail, in order to study the possibility of a British settlement in the area, particularly on Juan Fernández Island.194 In spite of the strategic importance of the project, the 1749 plan was not implemented due to the intense diplomatic actions of Spanish bureaucrats. These diplomatic actors had created significant international pressure, pushing the British Admiralty to cease maritime campaigns to the Pacific in the midst of the negotiations to end the War of Jenkins’ Ear, as Williams has

189 Walter, 90.
190 Walter, 92.
193 Walter, 92.
194 Buschmann, Iberian Visions, 73; Williams, The Great South Sea, 259–60.
Moreover, the intensification of the conflict between Britain and the Spanish and French empires during the Seven Years Wars further complicated any attempts to organise new expeditions during the late 1750s and early 1760s. During this conflict, the attention of the British imperial authorities was drawn to other more profitable maritime areas, such as the Caribbean Sea and the Philippines’ Pacific shores. Yet, Commodore Anson’s ideas for the further exploration of the unknown geographies of the SEP ultimately fed into the imperial projections of the British Empire in the South Atlantic and Pacific regions in the second half of the eighteenth century. The circumnavigation voyage organised by the British Admiralty and commanded by John Byron (1764-1766), was directly inspired by Anson’s enterprise and his 1749 project, as it emphasised the exploration and production of new knowledge of the South Atlantic and South Pacific islands. Byron, who had sailed with Anson twenty years before and was part of the tragic shipwreck of the Wager, used the knowledge provided by Anson as a guide for his navigation. As he established in his published account, Anson’s navigational route was particularly relevant for sailing along the waters on the Eastern Patagonian coasts.  

Anson’s voyage account’s emphasis on the production of instrumental knowledge for transoceanic navigation profoundly shaped the publication of the travel narratives of the Pacific explorers of the 1760s, namely the volumes written and edited by John Hawkesworth (1771), who compiled the expeditions of Byron, Wallis and Carteret, and Cook. These volumes described, mapped, and recorded geographic and hydrographic knowledge and information about the SEP in a more detailed and systematic way. Byron’s description of the Patagonian shores, particularly the details of the navigational route and the description of oceanic and weather conditions, illustrate the increasing importance attached to geographic knowledge in travel narratives. Moreover, after Anson’s published account, travel narrative editors gave more relevance to the integration of visual materials, such as drawing and maps, which, according to Buschmann, represented new “ways of seeing and narrating the Pacific”. Byron and Wallis’ voyage account, for example, incorporated several maritime charts about the SEP, including charts of places such as the Falkland Islands and the Magellan Strait, and coastal profiles of Tierra del Fuego and the Juan Fernández Islands. With these maps and detailed

195 Williams, 259.
196 Hawkesworth, An Account of the Voyages, I,12.
197 See for example Byron’s recommendations of how to navigate the Eastern Patagonian shores: Hawkesworth, I,43.
198 Buschmann, Iberian Visions, 102.
geographical descriptions, the British expeditioners were unveiling the unknown geographies of the SEP. The publication of this material not only made this knowledge available for a wider readership, but also intensified the imperial rivalries between Spain and Britain.

**Spanish expeditions to the SEP**

The impact of Anson’s enterprise not only prompted Byron’s Pacific expeditions in the mid-1760s, but also triggered an important reaction from the Spanish imperial authorities who organised exploratory expeditions of their own. In response to Anson’s squadron’s attacks in the Pacific Rim, the Spanish imperial authorities mobilised all their military resources to protect the maritime area comprehended from Panama to Chiloé Island. Historians such as Christon Archer, Gabriel Guarda, and Sabrina Guerra Moscoso have highlighted the way in which Anson’s voyage prompted important changes in maritime defence.\(^{199}\) These changes involved the construction of coastal forts and the organisation of constant patrols to safeguard Spanish American waters. For example, the Governor of Chile sent several military parties to guard the surrounding waters of Juan Fernández Island.\(^{200}\) Historians, however, have paid little attention to the production of geographic knowledge of the Chilean coasts and its adjacent islands as a consequence of Anson’s military expedition and the publication of his voyage account. Yet, after Anson’s expedition, knowledge became a vehicle for imperial competition, a catalyst for further rivalry between Spain and Britain. As an important connecting maritime space, the SEP became one of the multiple scenarios where these imperial powers would compete for political, intellectual and symbolic dominion.

Spanish American colonial authorities understood that in order to maintain political control over the SEP and to safeguard the Spanish interests in the region they would need more accurate knowledge of the region. They considered it especially necessary to acquire new knowledge about places located at the periphery of the Spanish zone of influence, such as Juan Fernández and the Western Patagonian islands, where Anson’s crew had harboured. For these reasons, the viceroy of Peru, José Antonio de Mendoza Caamaño, marqués de Villagarcía, called upon the services of the Spanish officials Jorge Juan (1713-1773) and Antonio Ulloa (1716-1795), who


\(^{200}\) Biblioteca Nacional (BN), Manuscritos Medina MS.M.35, Tomo 185, 4161, Letter of the Chilean Governor Manso de Velasco to the Peruvian Viceroy, 16 May 1742, fj. 210-218.
were in Guayaquil working with the French scientific expedition to measure the diameter and shape of the globe. Although visiting the Chilean colony was not part of their intended itineraries, the state of emergency produced by Anson’s expedition motivated them to navigate and survey the SEP’s coastal waters and adjacent islands. In the published account of their scientific enterprise, the officers explained the importance of their patrol enterprise, as the Chilean Captaincy’s coasts were regarded as the entrance to the “Peruvian Seas” and thus to the riches of the Spanish Empire. The aim of Juan and Ulloa’s enterprise was to produce useful knowledge about this threatened maritime region.

As Stuart McCook has revealed in the cases of botanical expeditions to the Caribbean region, the Spanish Empire dedicated resources to the development of scientific expeditions for several reasons. “First, it offered the empire potentially valuable commercial information. Second, it helped to contribute to the growth of scientific knowledge within empire, symbolizing the end of Spain’s intellectual isolation from the rest of Europe. Third, it contributed to imperial prestige in an age when Spain’s imperial rivals, France and Great Britain, where sponsoring scientific voyages around the world”. As the case of the Juan and Ulloa expedition shows, scientific hydrographic knowledge was a tool for defending the maritime sovereignty of the Spanish Empire in the SEP region. Furthermore, gathering information and producing new knowledge about how to navigate these waters, as well as identifying the best anchoring places and providing general descriptions of the coastal geographies were not only important in political and maritime terms, these practices were also relevant for the prestige and symbolic dominion of the Spanish in the Eastern Pacific. Spain needed this knowledge to regain control and legitimacy of its colonial dominion.

The knowledge produced and published by Juan and Ulloa’s expedition reveals the instrumentality of their scientific expedition, particularly in terms of their utilitarian depiction of the SEP. In their voyage account, the role of the SEP as an antemural was emphasised, shaping its perception as a strategic maritime area. In their published account, the coast of the Chilean Captaincy acquired a predominant place. This can be perceived in the considerable number of charts depicting important places on or connected to the Chilean coastline, such as the Juan Fernández and Chiloé Islands, and the bays of Valparaíso, Concepción, and Valdivia.

201 Antonio Ulloa, Relación Histórica del viaje a la América Meridional hecho de orden de S. Mag. para medir algunos grados del meridiano terrestre, y venir por ellos en conocimiento de la verdadera figura y magnitud de la Tierra, con otras varias observaciones astronómicas y físicas., vol. Segunda Parte, Tomo Tercero (Madrid: Antonio Marín, 1748), 269.
By comparison, other places in the American Pacific rim did not appear with such prominence; the published account only added a few key nautical charts of places as important as Cartagena, Portobelo, and Callao. This imbalance permits me to address the geostrategic significance of this maritime region during the mid-eighteenth century, and more importantly, to pinpoint the relevance of the production of cartographic and geographic knowledge about the hitherto peripheral Chilean coastline following Anson’s expedition.

Ulloa’s account also described the main geographical features of the SEP’s shores. Particular importance was again given to the Juan Fernández Islands, known for being the haven of Anson’s fleet and various privateers’ vessels in the past. The archipelago was described in detail, including its location, main hydrographical features and natural resources.203 The published account also integrated drawings of the coastlines, presenting coastal profiles of the island in a similar fashion to those produced by Anson’s expedition. In addition, Ulloa described the small island of Santa María, also known for having been a refitting place of privateers and buccaneers, as well as the bays of Concepción and Valparaíso.204 Moreover, the account added a table with the locations of the most significant coastal places, thus presenting a safe way of navigating the SEP.205

In symbolic and intellectual terms, the published account was also used to reclaim the geographies of the SEP, systematically organising the knowledge produced by the voyage with existing information. In this vein, and similarly to Anson’s voyage narrative, Ulloa’s account integrated visual and cartographic knowledge of the Eastern Pacific. This is particularly relevant since the Spanish Empire had become “an importer rather than a producer of maps”, as Buschmann, Slack, and Tueller have highlighted.206 During the first half of the 1700s, the Pacific region mainly featured in Dutch, French, and British maps, which, in turn, transformed the Spanish Crown into a consumer and reproducer of charts and maps of an area that they nominally dominated.207 Jorge Juan’s 1744 New and Correct Chart of the Pacific Sea [Nueva y Correcta Carta del Mar Pacífico] (Fig. 1.4) represents the Spanish response to the geographical knowledge produced by the other European powers. The chart depicts the Eastern Pacific from the northern Spanish possessions in New Spain to the southern parts of the

203 Ulloa, Relación Histórica del Viage, Segunda Parte, Tomo Tercero, 283–95.
204 Ulloa, 295; 320–28; 365–70.
205 Ulloa, 299.
206 Buschmann, Slack, and Tueller, Navigating the Spanish Lake, 40.
207 Recent research has addressed the Spanish role in the construction of knowledge about the Pacific in European atlases in the late seventeenth and early eighteenth centuries. See, Pinzón, “Las costas de la Nueva España”. See also, “Proyecto Hack” of the International GEOPAM Network: https://www.geopam.org/.
viceroyalty of Peru. It was divided into two main sections. The first shows the coastline from Acapulco in New Spain to the Maule River in Chile, and the second, represents the southern coastline from the Maule River to the Magellan Strait. As Ulloa explained, the map was produced following the observations of the naval officers, particularly what they observed and surveyed on the coastline from Panama to Valdivia. Furthermore, this practical knowledge acquired in their voyages legitimised the necessity of creating this new chart. According to Antonio Ulloa, previous cartographic representations of the region—both Spanish and foreign—contained many mistakes. For example, miscalculations of the currents and tides located the Peruvian and Chilean coasts “much more to the East than they really were”. With their surveys and astronomical observations, Juan and Ulloa hoped to rectify these errors. Furthermore, they validated their knowledge on the grounds of their empirical research and in situ observations.


209 Ulloa, 471.
210 In addition to those already revised by Juan and Ulloa, amendments were made to longitude values by Spanish officials in several other maritime areas during the second half of the 18th century. See Juan Pimentel, “A Southern Meridian: Astronomical Undertakings in the Eighteenth-Century Spanish Empire.” In *Navigational Enterprises in Europe and Its Empires, 1730-1850*, edited by Richard Dunn and Rebekah Higgitt, Basingstoke: Palgrave Macmillan, 2016, 13–31.
In spite of the emphasis attached to new empirical knowledge, Juan’s *New and Correct Chart of the Pacific Sea* also integrated information from earlier cartographies. This strategy was particularly relevant to depict places where neither Juan nor Ulloa had the opportunity to survey and chart. For example, the shores of Cape Horn were depicted using the surveys of the French captain Joachim Darquistade (1715), while the Western Patagonian coast, was depicted following cartographic data from various French sources, which they asserted as the most valid ones.\(^{211}\) The accuracy of this information, nevertheless, was highly questioned by the author, arguing that “about the course of the coastline nothing can be asserted”.\(^{212}\) As Ulloa explained in his published account, the Southern part of the Eastern Pacific, from Chiloé Island southward, was poorly known, which resulted in important errors and contradictory information in the existing charts.\(^{213}\) For the Spanish officers, this maritime area was in effect an unknown frontier, a space where there was not clear knowledge about its boundaries and its main geographical features. The cartographic knowledge available contrasted with the new data produced by local pilots who had gathered new information after wrecking along the Patagonian shores.\(^{214}\) Their knowledge and experience in situ was regarded as highly relevant, even when it questioned and challenged previous imperial images and knowledge about the southern shores of the SEP.

As the production of Juan’s map and Ulloa’s narrative shows, the knowledge provided by these local pilots, called *prácticos* by the colonial authorities, was crucial for the construction of the Spanish imperial geographical knowledge. In the colonies, these actors had an important reputation for their empirical knowledge and expertise about the local waters of the Eastern Pacific. Their knowledge proved to be useful for the cartographic and geographic knowledge developed by Juan and Ulloa. For example, Juan’s map incorporated information from the logbooks and navigational journals of Spanish American pilots, particularly in those areas where the officers did not have any other information, like Panamá Cove and Acapulco Bay in the North East Pacific.\(^{215}\) This is highly relevant as it demonstrates the collective nature of the production of maritime knowledge in the Spanish Empire. As Neil Safier has demonstrated,

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\(^{211}\) Ulloa, 481.

\(^{212}\) Ulloa, 477.

\(^{213}\) Ulloa, 476.

\(^{214}\) Ulloa was referring to the Spanish pilot Diego Gallegos who got lost in the Patagonian Channels, and the English Captain for the Wager David Cheap who wrecked in the seas surrounding the Chonos Archipelago. Ulloa, 475.

\(^{215}\) Ulloa, 471.
scientific expeditions and mapping enterprises are enabled by the collaboration of different actors, as well as the natural conditions of the environment and the material resources available. In the case of the production of knowledge about the SEP, Spanish American pilots, sailors, and indigenous people all played a relevant role in providing empirical knowledge about the sea, its shores and how to navigate it. In peripheral spaces, such as the Western Patagonian channels, the prácticos’ experience became even more relevant for the production of geographic and hydrographic knowledge as the following section will argue.

Expeditions from Spanish America

The outcomes of Anson’s expedition were far-reaching. The Spanish imperial authorities feared that the British were planning a new maritime intervention in the Eastern Pacific. In response, the government in the metropolis organised an expedition conducted by Francisco Orozco (1699-1761) who was sent to patrol and survey the SEP in 1748. Moreover, news from Chile indicated that the British might settle Juan Fernández Island, since they had been informed that Anson’s crew had left supplies behind that could be used to refresh and refit future expeditions. This concerning news and the publication of Anson’s voyage account in the late 1740s, as well as the effects of the British occupation of Manila and Havana during the Seven Years War, and the news of Byron’s circumnavigation prompted changes to the way in which the Spanish Empire comprehended, envisaged, and controlled the SEP. For decades, historians have paid attention to the response of Spain to British Pacific enterprises; however, few have explored Spanish American responses to these challenges. As Buschmann has demonstrated, any study of Spanish engagement with the Pacific Ocean needs to take into account the Spanish American endeavours. Building on this idea, this section examines the Spanish American production of knowledge about the SEP, addressing the role of the diverse actors who contributed to development of these local enterprises. In addition to Spanish America-based pilots, I explore the contribution of indigenous agents to the construction of knowledge about the interior Patagonian seas. This vast maritime area along with the adjacent islands on the Chilean coast had been under the domain of the colonial authorities’, whose

216 Safier, Measuring the New World, 8.
217 Archivo General de Simancas (SMA), Leg. 399, Letter of José de Carvajal to Marqués de la Ensenada, 6 June 1743.
219 Buschmann, Iberian Visions.
mission was to safeguard, defend, and produce knowledge about these geographies. In particular, this section will examine the exploration of Juan Fernández and Inche Islands.

In the decades of the 1750s and 1760s, the Spanish engaged with the SEP via different strategies. In addition to the constant patrols along the Pacific American rim, the Crown thought it appropriate to establish new colonies and military settlements on Juan Fernández Island and the remote Inche Island located in the Patagonian channels. Following Anson’s published account, the Spanish officials knew that these places had been used to refit and refresh the crew, and in particular, Inche Island had been discovered as a convenient place in which to harbour on the dangerous Patagonian coasts. The more aggressive British politics towards the Spanish domain of the Pacific had pushed them to secure their dominance in the little-known regions of the SEP. Furthermore, different conflicts with other European powers had led the Spanish Empire to shift their policies “from the right of discovery to proof of effective settlement”, which led them to pursue active control of the southern geographies.220

While the Juan Fernández archipelago had been claimed as part of the Spanish colonial territories since their discovery in the late sixteenth century, the small Inche island was one of the hundreds of islands located in the Western Patagonian channels, and had never before been claimed specifically as part of the Spanish Crown’s territories.221 The Royal Decree of 7 May 1749 instructed the creation of a colonial settlement on Juan Fernández Island and a military garrison on said Patagonian island.222 The governor of Chile, Domingo Ortíz de Rozas, supervised the creation of the colony, sending 171 men and women to settle in the island. The creation of the military fort on the Patagonian island of Tenquehuen was organised by the colonial authorities of Chiloé Island. They dispatched 32 men to build and guard the military post.223 However, the fate of these colonial enterprises was not a happy one. In May 1751, after a massive earthquake on the Chilean coast, the colony of Juan Fernández was struck by a huge tsunami. The waves destroyed the settlement, killing several settlers, including the governor

221 There were several attempts to colonise the islands of Juan Fernández during the colonial period. After its discovery, the Spanish pilot Juan Fernández tried to create a colony in the main island bringing in population and animals for this purpose. In the 1660s, the Jesuit Diego de Rosales had the project of creating a colony in the island of Más Afuera. See Vicuña Mackenna, Juan Fernández.
222 BN, Manuscritos Medina MS.M.36, Tomo 187, 4246, Governor Domingo Ortíz de Rozas to the Spanish King, 4 May 1750, fj. 47.
223 When the expedition arrived on the island, they found out that it was not Inche, but Tenquehuen. The term 'Inche' means 'my' in the local language. When the British men who had shipwrecked asked about the name of the island that they were in, the local people answered by saying 'my Island'. Ximena Urbina, Fuentes para la Historia de la Patagonia Occidental en el periodo colonial. Segunda parte: siglo XVIII (Valparaíso: Ediciones Universitarias de Valparaíso, 2018), 153.
and his wife. The military settlement of Tenquehuen Fort, on the other hand, was dismantled after eighteen months as its maintenance was considered too costly. According to Ximena Urbina, the building of this fort in this tiny island “was a futile enterprise, a small garrison lost in the immensity of the Patagonian seascape”.

In spite of these setbacks, the creation of these settlements represented important milestones for the production of knowledge about these peripheral places in the South Pacific. For example, the creation of the colony on the main island of the Juan Fernández archipelago led to the complete survey of this maritime environment. Further surveys were done once the colony was settled. The 1750 report of the captain Juan Bautista Bonet (1709-1786), summarises the geographical knowledge generated about the archipelago’s main island. Bonet’s report described the location of the island, the nautical features of the ports, the fathom of the coast, and its natural resources. The surveying activities of Bonet also might have had cartographic results. The map of Juan Fernández Island (Fig. 1.5) has no identified author; however, judging by the data displayed in the chart, it can be argued that it was drawn based on Bonet’s survey. This geographic and cartographic knowledge was instrumental for the Spanish settlement of the island, and its project to take control of and to dominate the SEP.

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224 Vicuña Mackenna, Juan Fernández, 275.
226 BN, Manuscritos Medina MS.M.36, Tomo 187, 4251, Description of the Juan Fernández Island by the Captain of the frigate La Esperanza Juan Bautista Bonet, 13 December 1750, fjs. 83-87.
While the colonial settlement in Juan Fernández Island allowed the Spanish Empire to control a peripheral but strategic maritime area, the military settlement on Tenquehuen Island in the Chonos archipelago enabled them to explore the unknown waters of Western Patagonia and examine the viability of a Spanish colonising project in this space. The instructions given to the governor of Chiloé Island by the Chilean colonial authorities emphasised the necessity of generating accurate nautical and cartographic knowledge about the Patagonian seascape. Since the early colonial period, Spanish officials based in Chiloé Island have had an active role in the organisation of exploratory enterprises to the unknown waters of the Patagonian channels, as Hanish and Urbina have demonstrated. In the seventeenth and eighteenth centuries, it had become customary for Chiloé Islanders to take the role of guardians and explorers of the southernmost region of the SEP. As Urbina has explained, *chilotes* [Chiloé Islanders] had explored the interior seas of the Patagonian channels after the British expeditions of John Narbourough and Basil Ringrose in the late seventeenth century, and had expertise in navigating the northern parts of the western Patagonian channels since they regularly collaborated with the Jesuits priests in their missions to evangelise Chonos communities on the

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adjacent islands. Following this tradition, the Chiloé authorities entrusted the ayudante Manuel Brizuela with the mission to build the military settlement, to record every detail of the navigational route, and to produce charts and maps of the Patagonian geographies. This knowledge was regarded as highly valuable by the colonial authorities, who had to send it back to the metropolitan authorities afterwards, as the instructions demanded.

Brizuela’s exploratory party fulfilled the commands of the Spanish authorities and took possession of the Patagonian island on 22 April 1750. He and his crew built a fort, produced new knowledge about Patagonian geography, recorded the navigational route, and surveyed and charted the island. However, this chart did not include the island’s absolute location in latitude and longitude. What possible use could a map be without the exact location? As a consequence, the local authorities sent a second party to rectify the strategic omissions made by Brizuela by producing new hydrographic surveys, as well as to contribute to the efforts of building and maintaining the military fort. The second expedition set sail later that year, in October 1750, commanded by the experienced sergeant [sargento mayor] Mateo Abraham Evrard in the company of 42 men distributed in three piraguas [local vessels]. As the governor of Chiloé noted in his correspondence with the viceroy of Peru, Evrard managed to successfully survey and map the island. I suggest that the Chart of the Anna Bay (Fig. 1.6) is therefore most likely Evrad’s work. Furthermore, a closer examination of this chart reveals that far from constructing new cartographic knowledge, the officials actually copied Anson’s map, translating the information into Spanish. This episode consequently poses important questions about the production and circulation of geographic and cartographical knowledge in the Spanish colonies.

One way to interpret these events could be to emphasise the failure of these local expeditions in generating new cartographic knowledge about the Patagonian channels. Yet examining the expedition members’ technical capacities and their ability to create knowledge reveals other dimensions to this event, posing questions regarding the local capabilities for producing new cartographic knowledge about the Patagonian channels. Yet examining the expedition members’ technical capacities and their ability to create knowledge reveals other dimensions to this event, posing questions regarding the local capabilities for producing

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228 Urbina, “Expediciones a las costas de la Patagonia”; Urbina, “Los ‘papeles de Londres’”.
229 BN, Manuscritos Medina MS.M.36, Tomo 187, 4245, Governor Domingo Ortiz de Rozas’s Letter to the Spanish King, 22 January 1750, fj. 43.
230 The party took possession of Tenquehuen Island but settled the island right next to it since the former did not have land suitable for building a fort. BN, Manuscritos Medina MS.M.36, Tomo 187, 4254, Governor Domingo Ortiz de Rozas’s Letter to the Spanish King, 24 December 1750, fjs. 102-103.
231 Urbina, Fuentes para la Historia, 156–63.
232 Mateo Abraham Evrard commanded his first expedition to the Western Patagonian channels in 1743. This expedition was sent to find any products left by the British in the Inche Island. Urbina, 148.
233 Urbina, 166. Evrad’s expedition also produced another map of the Patagonian seascape, comprehending the region from the Chonos archipelago to the Magellan Strait; unfortunately, it remains lost.
knowledge and changes in the conventions about what information a map should contain. This particular episode illustrates that the local expeditions had important capabilities for producing knowledge about the Patagonian seascape, as the reports of Brizuela and Evrad show. However, this knowledge did not always meet the standards of modern geography and cartography. As Brian Larking has acknowledged, standardization is frequently a form of power.\textsuperscript{234} The events of the 1750s expeditions reveal the imposition of new standards of mapping, that, in turn, made other forms of mapping and creating cartographic knowledge obsolete. Not only did local officials not have the technical knowledge to map the latitude and longitude of a location, but, most importantly, this particular way of mapping was not part of local tradition. In the 1600s and early 1700s, Spanish maps of the American colonies concealed strategic information, such as exact locations.\textsuperscript{235} Thus, Brizuela did not make an error, he was just following the principles of traditional Spanish mapping practices. As Matthew Edney has demonstrated, by the mid-eighteenth century, it had become standard for European maps to include the coordinates of longitude and latitude.\textsuperscript{236} The intensification of political and knowledge rivalry between Spain and Britain after Anson’s voyage and the publication of his travel narrative rendered the local traditional mapping practices obsolete. Aware of these changes, the colonial authorities in Spanish America pushed for the production of knowledge that met the conventions of modern cartography, imposing new modes of producing knowledge.

\textsuperscript{234} Edwards et al., “AHR Conversation, 1430.
\textsuperscript{235} For secrecy in Spanish maps about the SEP see, Rodrigo Moreno, “Magallanes entre los siglos XVI al XVIII: Cartografía Hispana para un Estrecho Incógnito,” Anales de Literatura Chilena 21, no. 33 (2020), 103-26.
\textsuperscript{236} Edney, Cartography. The Ideal, 104.
The knowledge generated by Brizuela and Evrard’s expeditions shaped Spanish engagement with the Patagonian waters. The officers agreed that the Chonos archipelago, particularly the Tenquehuen Island, did not provide the necessary conditions to build a colonial settlement. In their assessments, both navy men represented this space as a wild environment that could not be tamed. Furthermore, they estimated that a British settlement would be difficult to maintain due to the navigational and environmental conditions. Nevertheless, the new political situation after the end of the Seven Years’ War motivated the organisation of a series of new exploratory expeditions to the most peripheral and little-known areas of the SEP, particularly to the interior sea and Western Patagonian coasts and islands.

A second wave of local military expeditions to the Patagonian channels was organised by the end of the 1760s. The rumours of another British expedition in the mid-1760s, and the creation of a British settlement in the Falkland Islands after John Byron’s voyage set alarm bells ringing in the Spanish metropolis. By Royal Decree of 4 January 1767, the colonial authorities were

237 Urbina, Fuentes para la Historia, 164;166.
instructed to send expeditions to explore the SEP, particularly the area south of Chiloé Island.\textsuperscript{238} In response to the Royal Decree, three consecutive expeditions were sent from Chiloé Island to explore the Patagonian Channels. The Spanish authorities in Spain and America believed that the British could have established a settlement on the small and remote Madre de Dios Island, located near the Magellan Strait, as has been argued in Urbina’s research.\textsuperscript{239} Therefore, a precise and detailed survey of the Patagonian region was necessary to countermeasure British interest and imperial projections in the SEP.

The first expedition was commanded by Pedro de Mansilla who was instructed to survey the Guaitecas and Guayaneco Islands.\textsuperscript{240} On board three small vessels, Mansilla’s crew set sail from Chiloé in December 1767 and returned in May 1768, after reaching Latitude 53° South where Madre de Dios Island was located. The second expedition was directed by José de Sotomayor and the pilot Francisco Machado, sailing from Chiloé in December 1768. The crew was commissioned to assess and survey the Patagonian coasts. Finally, the third expedition was sent in November 1770 after the governor of Chiloé instructed the lieutenant Joseph Rius to continue the explorations initiated by Machado.

These expeditions contributed to the generation of new information and knowledge about the unknown geography and navigation through the Patagonian channels. For example, Rius’s navigation journal precisely recorded the route followed across the sea, describing the suitable ports, landing places, and where to find food and water.\textsuperscript{241} In the same vein, the pilot of the first expedition, Cosme Ugarte, presented a report that shows the records and calculations of latitudes and longitudes,\textsuperscript{242} while Mansilla’s journal briefly described the sea and landscapes of Western Patagonia.\textsuperscript{243} Furthermore, the pilot of the second expedition, Francisco Machado, critically examined previous cartographies of the Patagonian region, checking, comparing and commenting on them in his journal.\textsuperscript{244} In their navigation through the Patagonian channels, Machado paid particular attention to studying, exploring and fathoming key strategic places, such as Tenquehuen Island.\textsuperscript{245}

\textsuperscript{238} Urbina, 213.
\textsuperscript{239} Urbina, “La isla Madre de Dios”, 558.
\textsuperscript{240} Urbina, \textit{Fuentes para la Historia}, 215–16.
\textsuperscript{241} Urbina, 288–92.
\textsuperscript{242} Cosme Ugarte, “Diario Del Viaje de don Cosme Ugarte a las costas Occidentales de Patagonia 1767-1768,” \textit{Anuario Hidrográfico de La Marina de Chile}, 1889, 49–55.
\textsuperscript{243} Urbina, \textit{Fuentes para la Historia}, 221–32.
\textsuperscript{244} Francisco Machado, “Viajes del Piloto don Francisco Machado a los archipiélagos Occidentales de Patagonia,” \textit{Anuario Hidrográfico de La Marina de Chile}, no. XIV (1889): 112.
\textsuperscript{245} Machado, 124.
These expeditions are also relevant as they demonstrate the collective character of knowledge production in Spanish American enterprises. For the case of the exploration of the Western Patagonian waters, the Spanish officials and local authorities relied on the experience of local informants. It was usual for the expeditions organised in Chiloé Island to navigate with indigenous people from the Chonos or Caucahues communities (indios prácticos) or Spanish Chiloé islanders (prácticos), to guide their navigation through the Patagonian channels. As the instructions of the governor of Chiloé to Mansilla show, it was considered crucial to have “intelligent prácticos” to safely navigate this seascape in order to overcome every possible difficulty.\footnote{Machado, “Viajes del Piloto”, 79.} For example, the expedition commanded by Sotomayor and Machado received significant directions from the ‘Indio Domingo’, who helped them to navigate the channels when no other information was available to them.\footnote{Machado, 105.} Similarly, Mansilla’s route was guided by the route followed on previous expeditions and by the experience of indios prácticos. Moreover, when the weather conditions worsened and the navigation southwards became impossible, Mansilla and his crew relied on the experience of the indios prácticos to find a safe place to anchor.\footnote{Urbina, Fuentes para la Historia, 224.}

The practice of using local informants was not uncommon or only typical of the Spanish imperial operations in America. As Edney has noted for the Atlantic World, when entering new waters pilots generally “sought to draw on the lore of local informants and to incorporate it into their own corpus”.\footnote{Matthew Edney, “Knowledge and Cartography in the Early Atlantic,” The Oxford Handbook of the Atlantic World (2011), 91.} Indigenous people, in particular, actively engaged in the construction of knowledge of American geographies in the Early Modern Period.\footnote{See Gavin Hollis, “The Wrong Side of the Map? The Cartographic Encounters of John Lederer,” in Early American Cartographies, ed. Martin Brückner (University of North Carolina Press, 2011), 145–68.} Urbina, Reyes, and Belmar have documented the role of indios prácticos in the seventeenth and eighteenth century Chiloé expeditions to the Western Patagonian channels, addressing how they were instrumental in the navigation of the region.\footnote{Urbina, Reyes, and Belmar, “Canoeros en Chiloé.”} Additionally, scholars have explained the nature of this transfer, highlighting how their services were paid for in money and goods;\footnote{Urbina, Reyes, and Belmar, 340.} payment which did not differ much from the other members of the expeditions. Their knowledge was instrumental for navigating and exploring the surrounding waters of the Guayaneco and Chonos archipelagos in the northern part of the Patagonian channels, where the Chonos and Caucahue people used

\footnote{Machado, “Viajes del Piloto”, 79.}
\footnote{Machado, 105.}
\footnote{Urbina, Fuentes para la Historia, 224.}
\footnote{Matthew Edney, “Knowledge and Cartography in the Early Atlantic,” The Oxford Handbook of the Atlantic World (2011), 91.}
\footnote{Urbina, Reyes, and Belmar, “Canoeros en Chiloé.”}
\footnote{Urbina, Reyes, and Belmar, 340.}
to transit. The lack of accurate knowledge and the hazardous nature of this environment made the presence of these actors critical. Moreover, their key actions and roles in the Spanish American expeditions challenges the idea of the ‘unknown’. For the indigenous actors who participated in the voyages of exploration, the geographies of the northern Patagonian channels were familiar seascapes. They were part of the circuits and geographies frequented by the Chonos and other nomadic indigenous communities. This acknowledgement further contributes to recent historiography that argues that European geographic and maritime knowledge in the Early Modern period was largely built upon pre-existing networks, as has been demonstrated in the cases of the Indian Ocean and the Caribbean Sea.\textsuperscript{253} Furthermore, Spanish American expeditions to the Patagonian channels also benefitted from indigenous technology. As Ximena Urbina and Miguel Chapanof have stated, using indigenous vessels was a common practice in the Spanish expeditions to West Patagonia during the colonial period; these canoes, named \textit{dalcas} or \textit{piraguas}, made the navigation through channels, fjords, and shallow bays easier for the Spanish conquerors and missionaries exploring the region.\textsuperscript{254}

In spite of their efforts, the 1760s expeditions were not able to form clear and complete knowledge about the Western Patagonian Channels. The experience of these explorers emphasised previous images and geographical imaginations of Western Patagonia as a place of wild, dangerous, and untamed nature. Machado’s experience, for example, highlighted the difficulties of navigation in this region. The continuously stormy weather and the contrary winds blew them backwards and forwards, obligating them to return to Chiloé Island without meeting the goals set by the colonial authorities.\textsuperscript{255} Mansilla’s expedition followed a similar pattern. After reaching as far as the 53\textsuperscript{rd} parallel South, the party decided to return to Chiloé Island since the environmental conditions were unbearable. Mansilla and his crew not only endured ghastly Patagonian storms, but also the shipwreck of one of the vessels and the deaths of several crewmembers.\textsuperscript{256} Overall, the expeditions of the 1750s and 1760s were somewhat successful in producing knowledge of the northern part of the Patagonian channels. They illuminate how the Spanish American expeditions conformed to the latest standards and


\textsuperscript{254} Ximena Urbina and Miguel Chapanof, “El protagonismo de la dalca en las navegaciones australes coloniales,” in \textit{Actas de Las Jornadas de Historia Naval y Marítima de Chile}, Museo Naval y Marítimo, vol. 5 (2010), 64.


\textsuperscript{256} The crew members that died were part of another expedition that later joined Mansilla’s crew in their navigation back to Chiloé Island. This second expedition was a missionary expedition lead by the priest Juan Vicuña that had sailed from Chiloé to the Guayaneco Archipelago in 1767. Urbina, \textit{Fuentes para la Historia}, 230.
practices of geographic knowledge production, most notably in the production of maps. However, they also evidence the limits upon and restrictions to exploration activities in the mid-eighteenth century as the southern parts of the Patagonian channels from 45 degrees south to the entrance of the Magellan Strait remained unexplored. This desolate area, characterised by the absence of populations and the presence of icebergs and icesheets continued to be virtually unknown to the colonial authorities. The extreme weather conditions, the scarcity of resources, and, importantly, the dearth of knowledge, which was lacking to Spanish pilots and local sailors as well as the indigenous Chonos who collaborated with them, made this space almost impossible to explore and know for the Spanish Americans.

**Envisaged and imagined spaces in the SEP**

Carla Lois’s definition of unknown geographies contemplates real, imagined, and envisaged spaces. Anson’s map of the *Southern Part of South America* (Fig. 1.1) represents an interesting starting point for analysing how envisaged and imagined geographies coexisted with real/physical spaces in the production of knowledge and geographical representations of little-known spaces such as the SEP. Anson’s map featured real spaces, such as Patagonia, Tierra del Fuego, and Staten Island, but also included envisaged or projected spaces (such as the Falkland Islands) and imaginary places (such as the Pepys Islands). Intriguingly, even though commodore Anson and his fleet did not visit either the Falkland or Pepys Islands, both of these places were featured on his map. This section deals with the production of geographic and cartographic knowledge about the unknown geographies of the SEP, addressing in particular how the South Atlantic islands, real and imagined, were integrated into British and Spanish geographical discourses.

The boundaries between the South Atlantic and South Pacific Oceans were not clearly defined in the geographical imagination of the early modern explorers and cartographers. The voyage accounts of mid-eighteenth century British explorers such as John Byron and Samuel Wallis show that this region was conceived as part of the same maritime region, and was mostly thought of as a connecting space that permitted navigation from the Atlantic to the Pacific Ocean.257 Furthermore, as Buschmann has identified, after Anson’s voyage, the “Spanish diplomats opted to stretch their definition of El Mar del Sur into the Southern Atlantic Ocean

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257 See Hawkesworth, *An Account of the Voyages, I.*
to tie this set of strategic islands to their sphere of influence”. Thus, the South Atlantic islands, such as the Falkland Islands, and the geographies of Eastern Patagonia and Tierra del Fuego formed part of the projected and imagined geographies of the SEP.

The South Atlantic islands were featured early on in the European imperial geographical imagination of the southern oceans. It has been argued that the group of islands known today as the Malvinas or Falkland Islands were first sighted as early as 1502 by Amerigo Vespucci. The history of the European exploration of these islands is a contentious one, as the British, Portuguese, and Dutch all claim the discovery. For example, in the early 1590s, English explorer John Davis sighted the group of South Atlantic islands, recording this event in his voyage account. Later, in 1598, the Dutch mariner Sebald de Weert introduced the archipelago into European knowledge systems, naming them the Sebald Islands. These islands remained in the geographical imagination of this maritime region, appearing in different European travel accounts and cartographies. However, it was the British captain John Strong who in 1690, a century later, named them Falkland Islands after Anthony Cary, 5th Viscount Falkland, who had financed the expedition. From that point on, this group of islands continued appearing on European maps, particularly in French, Dutch, and British cartography. Other groups of islands, such as the Pepys and Aurora Islands, also appeared in British and Spanish accounts of the South Atlantic from the seventeenth century onwards.

The case of Pepys Island is representative of the complex process of constructing knowledge of remote and little-known geographies. This small group of islands called Pepys in honour of Samuel Pepys, Secretary to the British Admiralty, were supposed to be located at 47 degrees south, north of the Falkland Islands. They appeared for the first time in the voyage account of the buccaneer Ambrose Cowley (1686). In the early eighteenth century, the islands continued to appear on the maps of Edmund Halley and Herman Moll, and they were later featured in Anson’s voyage account and maps. According to Parker, the presence of these islands on British maps resulted from “the use of a limited source bank and the practices of early modern mapmaking”. This highlights the importance of knowledge circulation during this period. Mapmakers and armchair cartographers in London and other European cities often reproduced

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260 Parker, “Pepys Island,” 669.
the existing information available to them. Likewise, the scarcity of knowledge about these seas made the existence of Pepys Island credible.

Furthermore, the importance of these southern islands increased in the mid-eighteenth century as the imperial competition between Spain and Britain became fiercer. Since they were located far from the continent, and therefore away from Spanish maritime control, both the Pepys and Falkland Islands had the potential to be transformed in strategic places for the British imperial projection over the South Sea. They were identified as possible places for the refreshment of ships bound to the Pacific Ocean. Anson’s views about these islands are relevant for understanding the importance that they had in the midst of the imperial rivalries. According to the Commodore, these islands were crucial for British navigation as they could be used as refitting places.\textsuperscript{261} Even though he admitted that knowledge of them was “imperfect”,\textsuperscript{262} he considered them instrumental for the British imperial project in the Pacific region. According to him, the islands had the potential of opening the South Sea to British navigation in peace time, while during periods of war, the knowledge and possession of these islands could make them “master of those seas”.\textsuperscript{263}

The importance attached to these South Atlantic islands remained relevant in the geographical imagination of the British explorers of the 1760s and 1770s, who were keen to confirm their existence, survey and map them. John Byron’s case, for example, illustrates the quest of exploring and studying this maritime region. As can be read in his published voyage account, Byron paid important attention to searching for the location of the uncharted Falkland and Pepys Islands and describing the geography of the region. Furthermore, Byron’s account showcases the changes and the increasing relevance of producing new and accurate geographic knowledge as he carefully depicted the Falkland Islands’ main natural features, fauna, and resources.\textsuperscript{264} By carefully drafting new charts of the islands, Byron aimed to produce a more concrete picture of the South Atlantic coastal geography, creating an instrumental knowledge to British interests and projections over the SEP, reinforcing previous images produced by Anson’s about the geostrategic potential of this region.

While Byron and his crew successfully explored, surveyed and mapped the Falkland Islands, the location of the Pepys Islands remained a mystery to them. Even though they spent a

\textsuperscript{261} Walter, \textit{A Voyage Round the World}, 91.
\textsuperscript{262} Walter, 91.
\textsuperscript{263} Walter, 91–92.
\textsuperscript{264} Hawkesworth, \textit{An Account of the Voyages} I, 45–50.
considerable amount of time and resources searching for this small group islands, which were supposed to be located at 47° South Latitude, they were not able to find them. As a consequence, the existence of the islands became a contested matter. The writer/editor of Byron’s voyage account, John Hawkesworth, suggested that all the evidence indicated that Pepys Islands were in fact the same islands as the Falklands Islands, challenging existing accounts and cartographies that acknowledged them as real.265 In spite of this new piece of evidence, the Pepys Islands were not removed from British geographical imagination of the SEP altogether. They remained part of the geographies of the unknown, as they could still exist in theory. Indeed, members of Cook’s first expedition continued to look for them as they navigated through the southern waters.266

The case of Pepys Island was not unique. News of small and uncharted islands located in the South Atlantic or the South Pacific oceans was not uncommon in the mid eighteenth century. The peripheral location, the rigorous weather, and the hazardous navigation, transformed these oceans into spaces of speculation. This was the case of three small islands named Islas de la Aurora allegedly located in the South Atlantic. They were first spotted by the Peruvian commercial vessel Aurora, which in its navigation from Lima to the Atlantic Ocean reported the presence of these islands to the Spanish authorities in 1762. The reports located them in the 53° South Latitude, at about 35 miles East to the Falklands Islands. In the following years, Spanish American vessels navigating from the South Pacific to the South Atlantic continued to sight them.267 In 1794, the Spanish sloop Atrevida, part of the scientific expedition led by Alessandro Malaspina, surveyed and located them. Despite this news and the prestige that the Spanish expedition had, the matter of the existence of Aurora Islands remained contested by other explorers until the nineteenth century. British explorers, in particular, openly challenged Spanish discoveries and geographical knowledge. For example, in the 1820s the explorer and sealer James Weddell contested the existence of this group of islands, as in his navigation

265 Hawkesworth, I, 54.
266 Parker, “Pepys Island,” 675.
267 Josef Espinosa y Tello, ed., Memorias sobre las observaciones astronómicas hechas por los navegantes españoles en distintos lugares del globo las cuales han servido de fundamento para la formación de cartas de marear publicadas por La Dirección de Trabajos Hidrográficos de Madrid, vol. Tomo I (Madrid: Imprenta Real, 1809), 215.
through the South Atlantic and South Pacific he was not able to locate them,\textsuperscript{268} thus increasing the uncertainty around their existence and exact location.\textsuperscript{269}

The prevalence of the Aurora and Pepys Islands in maps and voyage accounts in the second half of the 1700s challenges established narratives that highlight the linear progress of scientific and maritime knowledge about the southernmost geographies of the American continent. The production of knowledge about the SEP was far from being a linear progression of scientific discoveries that ousted early geographical accounts. Byron’s voyage account, for example, can be read as an example of the complexity of the production of knowledge about remote and inaccessible geographies. While his enterprise helped to survey and accurately map key spaces such as the Falkland Islands and the Magellan Strait in the South Seas, it also reinforced previous ideas about the presence of giants in Patagonia.\textsuperscript{270} Therefore, rational and scientific discourses did not overcome previous and fantastic myths that surrounded the South Seas overnight.

Nevertheless, the systematic nature of its annotations, geographical descriptions, and the techniques employed in the production of charts and maps were signs that the paradigms used to understand and navigate the South Seas were changing. James Cook’s (1728-1779) expedition was especially influential in shifting the practices of maritime exploration. As Williams has argued, by the time of Cook’s voyage, the British Admiralty “had accepted oceanic exploration as part of its operation”.\textsuperscript{271} This process can be framed in Felix Driver’s concept of cultures of exploration: a set of “practices at work in the production and consumption of voyages and travels”.\textsuperscript{272} These practices comprehended the accurate recording of the navigational route, calculating and recording the location, surveying the coastline, charting and mapping, and the prompt publication of these records. This new culture of exploration changed how remote geographies were understood, experienced, and explored.

The emphasis on new knowledge about SEP geographies was particularly significant in Cook’s second voyage account, published in 1777, where he played a much more relevant role, directly intervening in its writing. In line with previous travel narratives, Cook’s second voyage account

\textsuperscript{268} James Weddell, \textit{A Voyage towards the South Pole, Performed in the Years 1822-’24. Containing ... a Visit to Tierra Del Fuego, with a Particular Account of the Inhabitants.} (London, Longman, Hurst, Rees, Orme, Brown, and Green, 1825), 61–62.

\textsuperscript{269} A decade later, in 1833, the \textit{Journal of the Royal Geographical Society} informed that Brig \textit{Tula} was not able to find the islands in their navigation across the southern oceans augmenting the suspicions about their existence.

\textsuperscript{270} Hawkesworth, \textit{An Account of the Voyages, I}, 31.

\textsuperscript{271} Williams, \textit{The Great South Sea}, xiv.

\textsuperscript{272} Driver, \textit{Geography Militant}, 8.
adopted a gentlemanly travel style travel to conform with polite discourse of the natural sciences, as Beth Tobin has recently argued. However, Cook’s narrative differed from its predecessors as he attached more importance to geographic and hydrographic description and to the analysis of the spaces that he and his crew had explored, surveyed and navigated. By emphasising the scientific scope of his travel narrative, Cook changed the way voyages of exploration were undertaken and, more importantly, altered the content and perspective of voyage accounts. Cook’s scientific practices of observing, recording, surveying, and charting would become the norm and model for every expedition from that point forward.

Furthermore, with Cook the sea was transformed into a space of scientific interest and representation. In the published account of his second circumnavigation, the Southern seas were converted into a hydrographic space to measure and fathom. As the Chart of the Southern Extremity of America (Fig. 1.7) shows, Cook transformed the waters that surrounded the Patagonian and Fuegian shores into spaces of hydrographic calculations. More than his predecessors, Cook emphasised the importance of detailed surveying, spending several weeks in the southern waters, collecting data from the sea and the shores, and relaying in the use of instruments such as sextants and chronometers. He was able to blend land-based triangulation surveying with offshore running surveys, which in turn, created more precise charts for the navigation. By doing so, Cook pushed further the ongoing process of Enlightenment mapping, framing it as an activity dominated by mathematics and instrumentation and popularising the idea of maps as reliable instruments and truthful images. Indeed, the importance that Cook attached to observations, surveying, and charting brought significant changes in the way in which the SEP was represented. For example, in his chart of the Extremity of America the Falkland Islands were carefully depicted in line with the previous representations created by McBride and Byron, while the Pepys islands were entirely removed as he had dismissed its existence after his first circumnavigation. This chart aimed to foster this new scientific narrative, depicting what was explored and surveyed. As he acknowledged in his voyage account, Cook assessed this space to be “sufficiently explored, to

274 Fernández-Armesto, Pathfinders, 300.
276 Cook had dismissed the idea of the existence of the Pepys Islands in his first circumnavigation voyage, Hawkesworth, An Account of the Voyages, 1, 40.
answer the most general purposes of navigation and geography”. By doing so, James Cook successfully dismantled previous geographical representations that related this geography with the unknown and even the mysterious.

Nevertheless, despite his effort to dispel fantastical representations of the SEP and depict what had actually been surveyed, the unknown remained part of his depictions of this maritime environment. A closer examination of the *Chart of the Southern Extremity of America* shows how the unknown was incorporated into Cook’s scientific practices of cartographical representation. This is the case for the Western shores of Staten Island (Fig. 1.8) and the Western coast of Tierra del Fuego and Patagonia, which in spite of their not being surveyed,

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277 Cook, 197.
278 Cook.
were depicted using broken lines. According to Lois, drawing broken lines was a strategy often used in European maps to represent the limits of what was empirically known.\textsuperscript{279} With this strategy, Cook shaped the cartographical depictions of these places, transforming these shores into projected or insufficiently explored spaces. The unknown, then, became framed in Cook’s scientific and empirical practices of exploration.

![Fig. 1.8. Close up Staten Land, in A Chart of the Southern Extremity of America (1775)\textsuperscript{280}]

Furthermore, by emphasising the idea of the sea as a space to be studied by science, Cook changed images of the SEP. He created a more certain idea of the geographies of this space and what it encompassed by naming newly discovered coastal places, natural harbours, and islands, as well as describing the details of how to better navigate this intricate geography. Cook’s chart of the Southern tip of South America (Fig. 1.7) not only integrated the newly discovered territories of the Falklands, South Georgia and the South Sandwich Islands to the southern extremity of the American continent, but it linked them to strategic places for transoceanic navigation, such as Cape Horn and the Magellan Strait. With this, Cook created a clearer picture of the hitherto unknown geographies of the SEP, connecting all of these strategic

\textsuperscript{279} Lois, \textit{Terrae Incognitae}, 77.

\textsuperscript{280} Cook, \textit{A Voyage towards the South Pole.}
places for British navigation. Maps and map-making practices were often used as tools to produce or feature new places. \(^{281}\) Cook’s narrative and visual representation of this maritime region fostered the idea of the potentiality and importance of the SEP, creating new places for southern navigation and promoting the idea that even though the navigation was hazardous, it was feasible with precise knowledge. \(^{282}\) Moreover, Cook created new representations of this environment that entangled it with images of rich and abundant marine life. For example, in the region around Cape Horn, he highlighted the abundance of seals and whales, noting how “the whole coast was full of them”, and how easy it was to hunt them. \(^{283}\) By doing this, Cook was opening the navigation of the SEP to new actors who were ready to challenge the adverse environmental conditions in order to profit from the hunt and exploitation of these marine animals. Moreover, it expanded images of the Americas as a bountiful land to encompass the SEP’s coastal lands and islands, including the shores of Patagonia and Tierra del Fuego, which had previously been depicted as wild, barren, and untamed spaces. \(^{284}\) With this, hitherto remote and desolated places started to gain economic and commercial projections.

The surveys done by Cook, and to a lesser degree by Byron, Carteret and Wallis, ultimately contributed to the comprehension of the sea as a space of scientific appropriation and description, marking the start of a new era in the relationship between European empires and the SEP in the late eighteenth century. Cook offered new information and knowledge about the southernmost parts of the American continent and its adjacent islands, and, importantly, he deepened the understanding and classification of the southern oceans. From Cook’s research onwards, a clearer definition and separation between the Atlantic, the Pacific, and the Antarctic Oceans began to slowly appear in the European geographical accounts and cartographies. As Edney has pointed out, with Cook, the concept of the expanded Atlantic gained traction as he introduced the term ‘South Atlantic Ocean’ in his charts. \(^{285}\) Likewise, the Southern or Antarctic Ocean began to appear in the geographical imaginations of the southern regions. \(^{286}\) Moreover, after Cook, the Southern Eastern Pacific was no longer an unknown geography, but an

\(^{281}\) Lois, *Terrae Incognitae*, 29.

\(^{282}\) In his published account, Cook continuously addressed the dangerous environmental conditions to navigation: winds, storms, violent tides, floating ice, and snow. Cook, *A Voyage towards the South Pole, and Round the World*, Vol. II:207–21.

\(^{283}\) Cook, Vol. II:194.

\(^{284}\) For general references of the Americas as bountiful spaces, see Daniela Bleichmar, *Visual Voyages: Images of Latin American Nature from Columbus to Darwin* (New Haven: Yale University Press, 2017); Olaya Sanfuentes. *Develando el Nuevo Mundo. Imágenes de un proceso.* (Santiago de Chile: Ediciones UC, 2010).


important region full of potential for navigation, knowledge production, and economic exploitation. However, the changes introduced by Cook’s representations of the SEP did not completely dismantle previous geographical imaginings. By the 1780s, Spanish Americans were still looking for the mythical lost City of the Caesars and the ghost island of Las Auroras remained in the geographical imagination of Spanish and British alike well into the 1800s. Similarly, other places emerged as wonderful havens and staging posts for transoceanic navigation. This was the case of the Isle of Grand, which was frantically searched for by whaler James Colnett in the 1790s. All in all, Cook’s expeditions marked a watershed moment in the way in which geographic, cartographic, and hydrographic knowledge was produced and communicated. Moreover, by navigating further South than any other explorer and discovering new geographies, he pushed the border of what was known further south, incorporating this experience in the new discourse of the ‘culture of exploration’. Significantly, at the centre of this new culture of exploration was the creation of visual artifacts, particularly maps, that made visible voyagers’ epistemologies, knowledge, and worldviews.

Conclusions

By the mid-eighteenth century, the SEP was a maritime space that was still scarcely known to European navigation and knowledge systems. In order to explore the geographical images of this maritime space and how the British and Spanish Empires produced knowledge about it, this chapter adopted Carla Lois’s concept of the geographies of the unknown. This concept has offered the opportunity to address how British and Spanish imperial actors produced geographic and cartographical knowledge about real and experienced geographies, but also the imagined and envisaged places of this little-known region.

George Anson’s maritime enterprise in the early 1740s had a greater impact upon the production and circulation of knowledge about the SEP than hitherto has been acknowledged. Following previous voyage experiences, namely Dampier’s voyage, Anson’s enterprise emphasised the generation of new geographic and cartographic knowledge. As a result, peripheral and little-known spaces, such as the Juan Fernández Islands, the tempestuous waters of Cape Horn and the Western Patagonian coasts, were surveyed, described, and charted. He also produced key navigational knowledge, fostering the navigation through open waters when

crossing from the Atlantic to the Pacific oceans and making transoceanic navigation safer. Furthermore, the publication of his voyage account transformed this knowledge into public knowledge, introducing this region into a wider readership. By doing so, Anson transformed geographical knowledge into a key vehicle for imperial competition, fuelling the rivalries between Spain and Britain for control over the SEP.

As this chapter has demonstrated, Anson’s maritime enterprise triggered important changes in the way in which the Spanish authorities engaged with the SEP, making what were considered peripheral shores into strategic places for Spanish projection over the region. According to the Spanish authorities, the SEP represented the portal to the Pacific region; it was crucial for the defence of the empire and for political dominance. After Anson’s enterprise, empirical and insitu knowledge was regarded as fundamental by the metropolitan and colonial authorities, marking an important shift from previous epochs. As the expedition commanded by Juan and Ulloa has shown, Spanish officers emphasised the necessity of producing their own knowledge and geographic information rather than relying on knowledge generated by the British.

There is an important risk in separating the expeditions conducted by the Spanish Empire into metropolitan and Spanish American enterprises as it can easily lead to the obscuring of patterns of circulation within the Empire. However, this chapter did so in order to stress the role and relevance of Spanish American actors in geographic expeditions. As has been argued, Spanish American colonies actively participated in the defence of and the production of knowledge about the SEP. The analysis of these enterprises has also allowed me to explore the collective character of knowledge production in the Spanish American expeditions. In the case of the Western Patagonian enterprises, the role of the indios prácticos and (non-indegenous) prácticos was instrumental for navigating these hazardous waters and producing key knowledge, such as the location of watering and harbouring places. Moreover, their crucial participation further fosters the idea that European geographic and cartographic knowledge was built upon pre-existing spatial networks, as has been addressed by historians of other oceanic regions. Therefore, the role of these actors as co-producers of knowledge needs to be recognised; they were central for Spanish imperial knowledge production and for engagement with remote and peripheral geographies such as Western Patagonia. Furthermore, for these actors, the seascape of the SEP was not unknown, it was a familiar geography that formed part of their spaces of circulation and livelihood. From this viewpoint, the idea of the geographies of the unknown stands as a category built from the perspective of imperial actors, and therefore should be recognised as a colonial interpretation of the space. Moreover, representations of this
seascape that characterised it a wilderness and an empty void should also be understood from this colonial perspective. For the indigenous communities of the Patagonian and Fuegian channels, this space did not have those connotations.

This chapter has also addressed the importance of environmental conditions and their role in shaping the representations and knowledge of the unknown geographies of the SEP. Non-human factors, such as winds, currents, and illnesses, became part of the human experience and engagement with the natural environment of the SEP. Moreover, as was addressed in the cases of the Mansilla and Machado expeditions, these adverse environmental conditions played an active role in shaping the imperial projects of the European empires in the SEP. Their experience navigating the Western Patagonian channels further deepened the geographical image of this region as an inhospitable space, unsuitable for any human activity, hindering Spanish colonial projection in the area.

The ways of presenting knowledge and geographical information underwent important changes in the mid-eighteenth century. The production of published voyage accounts along with visual representations of different geographies became a crucial feature of the circulation of geographical knowledge as the published accounts of Anson, Ulloa, Byron, and Cook demonstrate. In particular, the codification of spatial information in maps became one of the most important tools for transmitting geographical knowledge. Furthermore, in a context of intense imperial competition, the production of maps became ever more relevant, since they were particularly crucial in navigational spaces such as the SEP. They were considered political tools, used to gain knowledge and control of contested spaces, such as the Falklands, Staten, and Juan Fernández Islands, which, in turn, were integrated into imperial cartographies as stepping stones in transoceanic navigation. Likewise, the production of these maps needs to be contextualised in a period of changing practices and attitudes towards map-making. By the mid-eighteenth century, mapping practices were becoming increasingly scientific and specialised. This process led to the standardisation of map production, which started to include geographical data such as longitudes and latitudes as well as the scale of the map. The case of Brizuela’s failed map and Evrard’s copied chart showcase how this new cartographic language and mapping practices were imposed, leading to the obsolescence of traditional and local mapping practices and ways to create cartographic knowledge.

Additionally, this chapter has analysed the cases of the Falkland, Pepys and Aurora Islands located in the South Atlantic, framing them as part of the envisaged and imagined spaces of
the SEP’s unknown geographies. The representation of the Falkland Islands in British cartographies in the mid-1700s is a good example of the envisaged geographies of the SEP. These islands had remained a feature of European charts ever since their discovery by Dutch mariners in the seventeenth century, until they were charted in detail by John Byron’s expedition in the eighteenth century, fixing their presence in the cartographies of the southern regions. The prevalence of the Pepys and the Aurora Islands on European maritime charts and in geographical accounts, on the other hand, are examples of imagined geographies in the SEP: places whose existence could not be confirmed due to the hazardous navigational conditions in the southern oceans, but that remained a possibility. The analysis of these imagined spaces is relevant as it problematises previous narratives that highlight a progressive and linear vision of cartographical knowledge of the globe, particularly of the southern regions.

The introduction of a distinct scientific language and discourse in the expeditions of the 1760s and 1770s, with emphasis on hydrographic descriptions, soundings, and the introduction of more complex mapping practices such as the method of triangulation, did not entirely remove the presence of the unknown from the geographic and cartographic knowledge of the SEP. As has been argued in this chapter, with Byron and, more importantly, with Cook, the presence of the unknown changed form. Under the umbrella of scientific observation, it took the form of a projection of broken lines. Thus, the unknown was transformed into uncertainty: possible depictions of what uncharted lands would look like. This signalled an important departure from previous representations, as the scientific unknown was explicitly acknowledged and recognised as such. This mode of mapping gave the illusion of representing the different geographies with accuracy and precision, presenting real places in coexistence with projected ones. Furthermore, with Cook’s enterprise, the frontier of what was known was expanded by navigating further south than anyone before him, discovering uncharted islands, and indicating a greater confidence in the ability of science to conquer the unknown. Moreover, the quest to conquer the unknown was also translated into the exploration of other geographies, namely the elusive southern continent and the discovery of the North West passage in the following decades.

All in all, between the 1740s and 1770s, the period flanked by Anson and Cook’s circumnavigation enterprises, the Pacific ceased to be the “Spanish Lake” of the sixteenth and seventeenth centuries and became a trans-imperial oceanic space. In this changing context, the SEP was no longer a distant, unconquerable and unknown region as it had been in the past. From Cook’s enterprise onwards, this maritime region was transformed into a space subjected
to the scientific practices of exploration and mapping, framed by what Driver calls ‘cultures of exploration’. Furthermore, Cook’s enterprises not only incited a more active British engagement with the Pacific region: the publication of his second voyage account also opened up this maritime region to industrial exploitation. The following chapter will explore the ways in which whalers and sealers prompted the commodification of this seascape. By doing so, this chapter will introduce a new cast of actors that not only generated novel images of the SEP as a space of economic exploitation, but fundamentally produced new and empirical knowledge about this still little-known seascape.
Chapter 2: Commodification: Whalers, sealers and their informal knowledge communities

In 1839, Jeremiah Reynolds, an US officer, published a novel called *Mocha Dick or the white whale of the Pacific*, introducing for the first time the classic story of the hunt for the gigantic white whale in the cold waters of the Southern Eastern Pacific, later portrayed by Herman Melville in his *Moby Dick* (1851). Reynolds depicted an engaging narrative where whales and whalers came together as equals in the same inhospitable environment. His story presented “Mocha Dick”, an enormous, almost monstrous, whale-like creature that lived near Mocha Island neighbouring the coasts of Chile. Reynolds’s story helps us to bring to the fore how whalers created new images of the SEP, as a space of danger but also one offering great opportunities from which to profit. Furthermore, with the publication of their voyage accounts, whalers, as well as sealers, introduced these hitherto peripheral places to a global readership, connecting them to transnational routes of circulation of goods and people.

During the late eighteenth and early nineteenth centuries, hundreds of whaler and sealer vessels, mainly from the United States and Britain, crossed from the Atlantic Ocean to the Pacific Ocean in search of whales to hunt, finally breaking the nominal dominion of the Spanish empire over these waters. From the decade of the 1780s onwards, British whalers traversed the SEP searching for animals to hunt, first sporadically, but later more regularly, as the Spanish imperial authorities acknowledged the rights of British fisheries to hunt. The celebration of the Treaty of San Lorenzo between Britain and Spain (1795) put an end to the conflict between the powers after the Nootka Sound affairs, opening the Pacific to British navigation and commercial activity.\(^{288}\) British whaler enterprises had started to explore the Atlantic Ocean in search for whales to hunt from the early eighteenth century.\(^{289}\) The acquisition of larger vessels allowed them to traverse further south. By the 1770s, British whalers were actively hunting


\(^{289}\) According to British whaler James Travis Jenkins, the hunt for the sperm whales started by accident, when a North American whaler vessel was pushed by the wind into the deep waters of the Atlantic where they were able to capture the first sperm whale in 1712. James Travis Jenkins, *A History of the Whale Fisheries: From the Basque Fisheries of the Tenth Century to the Hunting of the Finner Whale at the Present Date* (London: H.F. & G. Witherby, 1921), 225.
near the coasts of Brazil, and by the 1780s Spanish reports continuously denounced their presence in the surroundings of Eastern Patagonia. The Treaty of San Lorenzo gave them the opportunity to freely navigate, explore, and exploit the waters of the SEP during the late colonial period. The Independence of the Spanish American territories in the late 1810s intensified the activities of whalers and sealers in this region as the internal markets became opened to trade and new commercial activities, particularly with Britain.

The migration patterns of the southern whales, especially sperm whales, were crucial for opening this environment to new routes of navigation and human circulation hitherto unknown to western societies. Sperm whales (*Physeter macrocephalus*) are present in many seas of the globe, but they are particularly numerous in the SEP.290 These animals used to migrate from colder and southern latitudes to reproduce and give birth in the SEP, particularly in the vicinity of the Humboldt current, which extends from central Chile to northern Peru and upwards to the Galapagos Islands.291 According to British whaler James Jenkins, whalers used to take advantage of these moments to kill as many whales as they could, making the SEP an excellent whaling site.292 In 1789, the British vessel *Emilia* was the first whaler vessel to enter the Pacific from the Atlantic in pursuit of whales.293 This event changed the history of southern fisheries, opening up a new environment to exploitation; whalers intensely hunted these mammals from the Falkland Islands in the South Atlantic to Mocha Island and the Galapagos Islands in the East Pacific. By the end of the century, it became common for British whalers to navigate into the SEP in pursuit of these big mammals, connecting these geographies to new economic activities and global navigational routes. Furthermore, whalers became relevant actors in expanding British maritime presence during the Age of Revolutions, particularly to those areas where the Spanish had previously held dominance.

Historian Ryan Tucker Jones has argued that the relationship between whales and their hunters during the eighteenth and nineteenth centuries created a coherent region in the North Pacific. According to Jones, whaler’s activities led to the generation of a unique ecological and cultural history that tightly linked human and animal circulation, arguing how “European patterns of movement around the North Pacific depended more on animal migration than they did on

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290 The Spermaceti Whale hunt was conducted in the coasts of Chile, Perú, California, Galapagos, and Marquesas Islands, as well as in the Indian and Chinese seas. See Jenkins, 209–10.
291 Cushman, *Guano*, 41.
292 Jenkins, *A History of the Whale Fisheries*, 244.
imperial designs”. By studying whalers’ activities, Jones has reshaped traditional geographies and the historical understanding of the North Pacific. Whaling, as a human activity, required human resources, such as vessels, labour, and tools, but it also involved an important connection with the environment and the creation of knowledge about it. Following Jones, this chapter examines the role of sealers and whalers in the production of new knowledge and geographical imaginations about the SEP.

Whalers were not the only new actors navigating the SEP. Sealers also became relevant agents in the navigation and knowledge production about the Pacific region. Sealing activities started in the South Atlantic and Pacific in the late eighteenth century started as a by-product of whaling activities; however, the lucrative business of pelts, fat, and oil transformed this activity into an industry of its own. Historians have highlighted the role of sealers in the process of linking different parts of the Pacific basin. David Igler’s work has been influential in the understanding of the eastern Pacific as a coherent and interconnected region. In this historical scenario, sealers and whalers were crucial in connecting the region as they exploited marine mammals from Alaska to Tierra del Fuego in a quest for gaining profit from killing these animals (a process that the author called the Great Hunt). In the case of the South Pacific, historians such as Eugenio Pereira Salas, Mateo Martinic, and more recently Marcelo Mayorga, have highlighted how whalers and sealers became familiar with islands and coastal lands of Patagonia and Tierra del Fuego, contributing to creating new routes of navigation.

Building on these ideas, I will further emphasise the role of these actors, highlighting the ways in which they created an informal knowledge community. This chapter argues that sealers and whalers were instrumental in the construction of new empirical knowledge of hitherto little-known geographies of the SEP, connecting them to transnational networks of commerce and navigation. By following the circulation patterns of the sperm whales and recognising the habitat of fur and elephant seals, whalers and sealers transformed this oceanic space from peripheral and remote to known geographies relevant for the transnational industries of animal exploitation. In doing so, they generated new images of the sea as a space full of resources from which to profit, transforming this environment and the animals that inhabited it into commodities.

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295 Igler, The Great Ocean.
Moreover, the impact of the activities of sealers and whalers in Spanish America during the Age of Revolutions had greater repercussions than hitherto has been acknowledged in the geographical imagination about the sea. Historians on the Spanish American enlightenment have stressed the new value of nature in the discourse of ‘men of science’ and imperial authorities. These works have focused on the terrestrial ground, highlighting the relevance of mining sites or South American jungles and forests to exploit in benefit of the progress of the empire and the newly formed republics. This chapter explores the ways in which the images fostered by sealers and whalers about the SEP stimulated Spanish American hunting projects which led to commodification of this environment.

This chapter is divided into four sections. The first part examines the role of whalers in the production of new knowledge about the SEP’s navigation. The second section explores the concept of the commodification of nature as it analyses the case of sealing and its contribution to the knowledge about the SEP. Section three argues that the active presence of whalers stimulated Spanish American hunting and fishing enterprises, deepening the process of the commodification of this maritime environment. Finally, section four explores the way in which whaling enterprises contributed to the general knowledge of southern mammals, analysing the role of hitherto marginalised actors such as medical practitioners, who produced natural histories of whales. This section also deals with the emergence of creole knowledge about America’s marine animals, particularly analysing Juan Ignacio Molina’s contribution to SEP whales.

**Whalers: a new community of empirical knowledge**

The discovery of large number of sperm whales in the SEP changed the British whaling enterprise, opening a new environment for their hunting activities. Sperm whale oil was deemed to be of far superior quality than that of other whales. As Igler has explained, the spermaceti produced by the sperm whale was considered the “cleanest and most expensive oil” utilised to lubricate delicate and costly machinery and for illumination. An adult male sperm whale could produce as much as one hundred barrels of oil; therefore, these animals were transformed into a highly valuable commodity. Whale products fuelled Britain’s increasingly

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industrialised economy. Yet, British hunting enterprises in the SEP was costly, both in terms of money and time, making it more expensive that the hunt in other oceanic regions. All in all, by the turn of the nineteenth century, the industry boomed as prices in whaling product increased and previous restrictions of British navigation in the Pacific were no longer in place, since Spain and Britain had reached peace after the Nootka Sound conflict in the mid-1790s. Knowledge of how and where to hunt these marine mammals became crucial for the developing British whaling industry. By studying the case of James Colnett, this section examines the role played by whalers in forming a new informal community of knowledge about the SEP. Recent scholarship has recognised the role of US whalers in the construction of national US knowledge about the Pacific. Building on this research, this section argues that the whalers were important in the production of empirical knowledge about how to navigate the SEP’s waters, opening this environment to new commercial networks and British imperial engagement in the Pacific region.

British hunt the whale in Spanish domains at great cost of money and time

By the late eighteenth and early nineteenth centuries, whaling in the Eastern Pacific was a booming economic activity, mostly developed by North American whalers. British whaling enterprises usually hunted the seas of the Northern Hemisphere, only occasionally moving toward southern latitudes. However, the interest of exploiting new and plentiful places motivated the merchants of the city of London to promote new surveys in the southern seas. In 1793, the merchants hired the services of Captain James Colnett (1753-1806) to conduct a voyage to explore the Pacific Ocean in order to assess the commercial potential of whaling in this oceanic region. Colnett’s task was to navigate around Cape Horn to discover new routes and secure places to anchor for the South Whale Fisheries. Colnett had great experience as a seaman, particularly in the Pacific, as he was a midshipman in James Cook’s second voyage around the world (1772-1775). In the mid-1780s, after leaving the British Royal Navy, Colnett started to work in the North Eastern Pacific as a fur trader to Chinese markets for seven years.

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301 Igler, The Great Ocean, 118; see also Jones, “Running into Whales”
303 James Colnett, A Voyage to the South Atlantic and round Cape Horn into the Pacific Ocean for the purpose of extending the Spermaceti Whale Fisheries, and other objects of commerce, by Ascertaining the Ports, Bays, Harbours, and Anchoring Births, in certain islands and coasts in those seas at which the ships of the British Merchants might be refitted (London: W. Bennett, 1798), viii.
With this experience, Colnett and a crew of seventeen seaman and officers set sail to the Pacific on board of the sloop *Rattler* in January 1793. They visited the American Pacific Rim, from Tierra del Fuego to Baja California, surveying in detail the main whaling points such as the Galapagos Islands. The crew returned to England in November 1794. Four years later, Colnett published his account, which also contained new and original maps of the region. By publishing this account, the British whaler aimed to describe the best ways of navigating the Pacific region and to discover docking places for the British whaling industry.

The focus of Colnett’s narrative was to create instrumental knowledge for British navigators and the whaling industry. As he stated in the introduction of the published account: “I possess the hope of my work may contain some portion or professional utility”.

In particular, he focused on describing the maritime and navigational conditions across the SEP, reporting with great detail the direction of winds, the changing weather conditions, and depths of the coasts after his fathoming activities. In addition, he produced a thorough account of his navigational route, indicating the coordinates of longitude and latitude at all time and correcting the position of key places.

Colnett also addressed the best way of navigating the southern passage of Cape Horn, recommending to traverse it by “the beginning of winter or even winter itself with moonlight; for in that season the winds begin to vary to the Eastward”, making the navigation easier and quicker.

In his navigation through the SEP, Colnett was able to produce new knowledge about hitherto little-known places. For example, he described several of the southern islands, such as Tierra del Fuego and Diego Ramírez, scarcely known by western readership, recording their location and general data about the landforms of these islands and the animals that inhabited them. In his account, Colnett was adamant about the importance of taking possession of Cape Horn; he considered it to be a crucial and strategic place for British navigation and whaling endeavours, particularly as more whaling enterprises were adventuring further south in pursuit of these animals.

Following a school of sperm whales, Colnett sailed towards Chilean waters in April 1793, examining the coast of Western Patagonia—namely Pink Ann Bay, where part of Anson’s party wrecked in the early 1740—and the Chilean coasts and adjacent islands in search of whaling sites and anchoring places. Mocha Island, for example, was acknowledged as an

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304 Colnett, xvi.
305 For example, Colnett corrected the position of Diego Ramírez Island, an important point of reference for the navigation through Cape Horn, Colnett, 18.
306 Colnett, 19.
307 Colnett, 20.
important whaling site in the SEP. The crew was able to sight a great number of whales, although they managed to capture only a couple of them near the island’s coastal waters.\footnote{308}{Despite the abundance of these animals near Mocha Island, Colnett and his crew managed to kill two and save only one to extract its oil. The weather conditions, the lack of experience of both the crew and the captain, and the behaviour of the school of whales made the hunting enterprise very difficult. The crew ended up hurt and sick after this hunting attempt. Colnett, 29.} The Desventuradas Islands – San Félix and San Ambrosio Islands– were explored as refitting places. Following the knowledge produced by early eighteenth-century British privateers, Colnett chose these islands, instead of the more familiar and known Juan Fernández Islands, as he knew that they were constantly being patrolled by Spanish maritime forces.\footnote{309}{Colnett, 40.} He concluded that the Desventuradas were full of important natural resources, such as fish and seals; however, the contrary winds made harbouring too difficult.\footnote{310}{Colnett, 35.} According to Colnett, British sailors and whalers could use them only in case of emergency, as they were easy to defend from enemies.\footnote{311}{Colnett, 36.} Other places in the Eastern Pacific, such as Lobos and the Galapagos Islands were also mentioned as relevant whaling places. By focusing on these islands, Colnett managed to produce new empirical and instrumental knowledge about the geographies of the SEP, describing these places in terms of where to hunt and where to refit the crew, crucial for British whaling and commercial projects in the Pacific.

Furthermore, by detailing his route from the Falkland Islands in the Atlantic Ocean to the Desventuradas Islands in the Pacific Ocean, Colnett opened this peripheral environment to navigation and exploitation. In this sense, one of the most important changes in Colnett’s narrative, when compared with older accounts, was his description of this seascape as a space with plentiful marine resources. Previous accounts from the sixteenth century onwards, such as those of Francis Drake, Pedro Sarmiento de Gamboa, George Anson, and John Byron highlighted the dangerous conditions of southern navigation. Colnett, on the contrary, portrayed this space as one of great opportunities as he remarked upon the abundant quantity of whales, and other mammals like fur seals, elephant seals, and sea lions, similar to Cook’s representation of this environment.\footnote{312}{Colnett, 28.} Even though he did not hide the dangerous conditions of navigation, it was secondary to his purposes of creating a narrative that enhanced the opportunities of exploitation.
The maritime charts incorporated in his published account depict Colnett’s instrumental vision of the sea. Engraved by mapmaker Aaron Arrowsmith, these cartographies summarise and visually condense what it was described in the book. Moreover, it illustrates how by the late-eighteenth century, the practice of producing voyage accounts containing visual information and charts was consolidated, becoming part of what was referred to in the previous chapter as a “culture of explorations”. Colnett’s narrative integrated several charts of the places he visited in his voyage, namely Socorro, Galapagos and San Félix and Ambrose Islands in the Eastern Pacific, as well as coastal profiles of prominent places for navigation across the South Seas, such as Diego Ramírez Island. Furthermore, the published account included a general chart entitled “chart showing the track of the ship Rattler from Rio de Janeiro round Cape Horn, to the coast of California” (Fig.2.1). It presented the route followed by Colnett and the exact location of key places for whaling such as Mocha and Lobos Island, and Punta Angeles in California. Remarkably, this chart highlights places that were peripheral in other accounts. In this sense, remote locations like Staten Island and San Ambrosio and San Félix Islands gain relevance and status as whaling sites or refreshment places. Hence, the whaler account transformed previously peripheral places into important places, incorporating them into a new network based on the exploitation of animals and the commerce of its products.

In his exploration, Colnett also had to deal with the unknown geographies of the SEP, its imagined places and the inaccuracy of available information. This is the case of the Isle of Grand. The Board of the Admiralty had recommended that he look for it as the first objective in his exploratory voyage; it was supposed to be located near 40 degrees southern latitude, in the South Atlantic. The Isle of Grand was believed to be a good stopping place, suitable for anchorage to refit the vessels and refresh the crew. Colnett became obsessed with this quest; however, he was not able to find the place. His chart of South America (Fig.2.1) included a description of the alleged place where the island was supposed to be located, pointing out instead the existence of a “great number of birds, drift wood, birch twigs, sea weed and black whales.” As with many other imaginary places of the SEP, the “Isle of Grand” appeared in European accounts, depicted as a place of great resources. Quoting Spanish and French accounts, Colnett described it as a “temperate and pleasant country, in a situation very favourable for carry on the whale fishery and others” and to conduct commercial activities to

313 See Driver, Geography Militant.
314 Colnett, A Voyage to the South Atlantic, 8.
the southern countries. After a thorough examination of its supposed location, Colnett concluded that the Isle of Grand did exist, but his failed attempt of finding it was due to “an error in copying the latitude”. He was certain that the acquisition and colonisation of a place in the SEP such as Isle of Grand, would accord the British a great advantage in the business of whaling and sealing.

Even though Colnett’s voyage was not successful from an economic perspective, as he captured little prey, his surveys and the recording of his route proved very useful for the whalers that followed him.

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315 Colnett, 13.
316 Colnett, 13.
Fig. 2.1: James Colnett, *A chart showing the track of the ship Rattler from Rio de Janeiro round Cape Horn, to the coast of California*, by Capt. James Colnett of the Royal Navy 1793-1794. (1798)\textsuperscript{318}

\textsuperscript{318} Colnett, *A Voyage to the South Atlantic.*
Colnett’s enterprise was not unique. An example of this can be found in Edward Robarts’ hunting experience through the Pacific. Robarts (c.1770-1832?) was a Welsh seaman and, like many other British sailors of that period, he joined the whaling vessels to navigate through the Pacific.319 On board of the ship *Euphrates*, Robarts and his crew followed Colnett’s navigational route, passing around Cape Horn and then sailing northwards to Mocha Island, looking for the first whales to hunt. As his luck was limited in this place, killing only a couple of sperm whales, Robarts moved then to the Galapagos Islands in search of the migrating mammals, and from there sailed further north to the coast of California.320 The navigation of whalers such as Colnett and Robarts, was part of a wider process of the expansion of British whaling and exploration to the northern and southern seas. As Michael Bravo has analysed for the Arctic exploration conducted by whaler William Scoresby, these enterprises belonged to a “long tradition of commercial improvement serving [British] state interests”.321 Whalers such as Colnett and Scoresby were crucial figures in producing knowledge of remote and uncharted oceanic regions, and were very important in promoting the development of British industries and maritime presence around the globe. Mapmakers such as Arrowsmith popularised charts and drawing produced by Colnett’s account, selling them separately and profiting from the whaling expanding market.322 Significantly, Colnett’s account and the knowledge that he and his crew produced was particularly instrumental in opening up the Eastern Pacific for the British whaling industry specifically, and for British navigation more generally, ultimately breaking the weak and dwindling dominance of the Spanish empire over these waters.

In turn, Colnett and the whalers who followed him transformed the SEP from an unknown and peripheral navigational space to a central place of hunting and navigation. The reception of Colnett’s narrative was very positive. Contemporary reviewers highlighted the importance of the book for the knowledge of Pacific navigation and islands.323 British whaling enterprises, such as the one produced by Colnett, familiarised a wider audience with remote landscapes, such as Staten and Mocha Islands, transforming them into strategic places for this industry, expanding British presence in hitherto unexplored geographies. Furthermore, they changed the

320 Dening, 35.
way in which this sea was depicted and experienced. For these whalers, the cold waters of the SEP became battlegrounds, where the price was the profit made off dead animals, as the story of \textit{Mocha Dick} exposes. The environmental impact of these first wave of Pacific whaling still is discussed, particularly in relation to “the hunt’s impact on Pacific whale numbers”\textsuperscript{324}. However, by traversing the sea in search for whales, these actors produce new empirical knowledge about the sea and its navigation, integrating this seascape into a network of commerce and animal exploitation. By doing so, they also contributed to the knowledge of the SEP’s islands and coastal lands; however, they were not as central to this endeavour as sealers.

\textbf{Sealers as agents of commodification and knowledge}

Captain Cook’s second book about his voyage of exploration around the world (1772-1775) encouraged European and American sailors to navigate towards the southernmost latitudes in search for animals to hunt. In Cook’s account, the South Atlantic and South Pacific lands were depicted as places with an abundance of marine animals, highlighting how easy it was to catch them. At Staten Island, for example, Cook emphasised the number of seals that inhabited these coasts, claiming that it did not matter “where [they] landed, for the whole shore was covered with them”\textsuperscript{325}. When they landed on South Georgia Island, the account highlighted the abundance of fur seals\textsuperscript{326}. Moreover, Cook addressed the profusion of other animals such as the elephant seal (\textit{Mirounga leonina}), which could be killed “for the sake of their blubber, or fat, to make oil”\textsuperscript{327}. The images of the SEP depicted by Cook’s account drew the attention of whalers and sealers who navigated through faraway islands to catch fur seals for their skin and elephant seals for their oil and in order to trade them in Asian and European markets.

Sealing activities in the SEP started as a by-product of whaling enterprises; however, the ravenous desire for sealing goods transformed it in a profitable enterprise of its own. While British sealers hunted sea lions and elephant seals in order to take advantage of their oils, North American sealers hunted for fur seals, trading their pelts in Chinese markets. Sealers’ practices differed from those of whalers due to the fact that sealers need to work inland, while whale hunting was conducted in the ocean, leading to sealers’ exploration of little-known coastal

\begin{footnotesize}
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\item \textsuperscript{324} Ryan Tucker Jones, “The Environment,” 132.
\item \textsuperscript{325} James Cook, \textit{The Three Voyages of Captain James Cook Round the World}. vol. IV (London: Longman, Hurst, Rees, Orme and Brown, 1821), 178.
\item \textsuperscript{326} Cook, IV:195.
\item \textsuperscript{327} Cook, IV:179.
\end{itemize}
\end{footnotesize}
lands in Tierra del Fuego, and southern islands like Más Afuera or South Georgia Island. This section focuses on the role played by British sealers in the commodification of the SEP and their contribution to the creation of knowledge about the SEP’s islands and coastal lands. By publishing their hunting experiences, sealers introduced the remote geographies of the SEP to a wider readership. In these accounts, sealers described several of the SEP’s islands and coastal lands, connecting this maritime region with the geographies and markets of India, China, North America, and Australia in a narrative where sealing, commerce, and knowledge of remote shores were the protagonists. This section argues that these actors were key agents in the production of empirical knowledge about the SEP, becoming instrumental for the construction of British imperial geographical imagination and knowledge about the southern seas.

North American sealers were the first to traverse the SEP hunting for these animals. At first, these sealers hunted along the Atlantic coast, harbouring at East Patagonia, and the Falklands and South Georgia Islands. However, the rapid extermination of the animals in eastern Patagonia motivated the sealers to go further south and even to travel around Cape Horn in pursuit of their prey. In the southern tip of South America, North American sealers usually hunted at the islands of Diego Ramírez, Staten Island, and the vicinities of Cape Horn. As the population in these places reduced, sealers moved to the Pacific shores. One of the first known vessels to operate in this region was the US brig Hancock in the 1790s, opening the Eastern Pacific for hunting activities. By the turn of the century, sealers had reached the marine-life rich Juan Fernández Islands, making them a hub of their lucrative killing enterprise. As the account of the North American sealer Edmund Fanning (1769-1841) demonstrates, sealers were able to kill thousands of fur seals in one hunting trip. According to Fanning, in about ten years North American sealers had already taken roughly a million fur seals on this island to sell in the markets of Canton, driving the specie almost to the point of extinction. North American sealers such as Fanning and Amasa Delano (1763-1823) published their

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330 Martinic, 12.
331 Fanning visited Más Afuera Island in January 1798, where he and his crew stayed over three months, leaving in April with their ship Betsey full of pelts. Their cargo was so large that they had to leave more than 4000 skins on the shore. Edmund Fanning, *Voyages & Discoveries in the South Seas, 1792-1832* (Salem, Mass.: Marine Research Society, 1924), 79.
332 Fanning, 80.
hunting adventures across the Pacific region, fuelling the interest of other transnational actors to participate in this profitable business.

Like their US counterparts, the action of British sealers along the coasts of the SEP entangled this region in a commercial network and imperial geographies. During the Age of Revolutions, British sealers became active agents in the imperial rivalries facilitating the production of geographic, cartographic, and hydrographic knowledge of the oceans, and the expansion of British commerce and connection with transnational markets. In particular, after the Napoleonic Wars, as Britain consolidated his hegemonic power, sealers helped to expand Britain’s presence in the oceans of the globe. The case of British sealer James Weddell illustrates how sealers produced new knowledge about SEP geographies for the purposes of developing British industries and navigational knowledge about this little-explored region. The case of Weddell is exceptional among his contemporaries as he decided to publish strategic knowledge, whereas other British sealers choose to maintain their navigational route as a secret to avoid competition.

James Weddell (1787-1834) was a British sailor and seal hunter. In 1819 he travelled for the first time to the South Atlantic in pursuit of sea lions and elephant seals for their oil. During his second trip, between 1822 and 1824, Weddell sailed with his crew of 35 men and two vessels towards the South Atlantic; in their hunt for sea animals, they navigated further south than was customary, eventually reaching the Antarctic Circle. In 1825, he published the account of his travels in order to make public the occurrences of the voyage and to contribute to the knowledge of this region. According to him, it was necessary and useful to publish what he discovered and encounter in the southern regions. Thus, in his published account, Weddell committed himself to produce knowledge about the southern latitudes and make it public for the British maritime community, arguing that after “having performed a voyage of investigation to a higher southern latitude than has hitherto been attained, I have thought that it might be expedient, especially for the benefit of hydrography”. Even tough Weddell did not present himself as the most knowledgeable person in hydrographic and geographic fields,
he claimed that his experience and pragmatic expertise provided him with sufficient knowledge to make public his discoveries and explorations. Hence, Weddell created a detailed account of his navigation across the SEP and within the Antarctic Circle, carefully depicting these geographies, despite not being equipped with the latest technology, as he argued.

Like Colnett, Weddell centred his account on the idea of producing useful and instrumental knowledge for British navigation and hunting enterprises. Thus, keeping records and making surveys of the coastal lands that he encountered was a priority for him. Each landing spot was recorded with the crew’s location, the situation of the winds, the best places to anchor, and other relevant geographical information including the location of rivers and natural resources such as drinking water and combustibles. Weddell equally emphasised the study of the navigation of key or difficult places. For example, he spent two months navigating and surveying the vicinity of Cape Horn, where he remarked that although this passage had been visited many times, there was no accurate knowledge of “its coasts and harbours”. According to Weddell, “a familiar knowledge of these shores must evidently tend to lessen the timidity which seizes the minds of some commanders in passing this cape” and other southern islands. Furthermore, he believed that an exact knowledge of the currents and the precise information about safe harbours to anchor at during adverse gales could not only enhance navigation, but make it more common among British sailors. The latter was perceived by Weddell as a crucial development for the progress of commerce and science in the southern regions.

Weddell believed that his most relevant contribution to knowledge was the information of how to navigate towards the Antarctic Circle. He argued that his intentions were to observe and record phenomena interesting for science: “I was well aware that the making of scientific observations in this infrequent part of the globe was a very desirable object”. After navigating three degrees farther south than Capitan Cook, Weddell wondered: “how was it possible that the South Pole should not be more attainable than the North?”. For Weddell, the Antarctic ocean was as navigable as the Arctic, and he commented that both the North and South Pole had similar features, namely the presence of ice islands (icebergs). Supporting the ideas of

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336 This was a very common trope and rhetorical device among "practical men" who, by presenting themselves as not knowledgeable, appealed to the readership, which emphasised the value of their empirical observations and framing them as useful.
337 Weddell, 5.
338 Weddell, 5.
339 Weddell, 37.
340 Weddell, 41.
341 Weddell, 40.
Cook, Weddell concluded that there was no land further than the 73 degrees south latitude. By highlighting this point, he fostered the idea that it was possible to navigate in these southern latitudes and, more importantly, encouraged further navigation and research since he considered that this environment was a “clear field of discovery”.\textsuperscript{342} After navigating for a month within the Antarctic circle, Weddell and his crew reached 74°15’ south and 34°16’45” west, further than hitherto had been attained, regretting not being able to progress any further due to the lateness of the season.\textsuperscript{343}

The idea of creating accurate and rigorous knowledge of the region also manifested in the production of multiple cartographies of the region. In his book, Weddell published the charts and plans of Santa Elena Bay in East Patagonia, the South Orkney Islands, the South Georgia Islands, Cape Horn, and Tierra del Fuego, among others. Similar to Colnett and the explorers of the late-eighteenth century, Weddell used these cartographies as visual tools to strengthen and support his geographical and hydrographical research. His “Chart of the tracks of the vessel \textit{Jane and Beaufoy}” (Fig. 2.2) depicts the voyage route of Weddell and his crew. In the chart there is special care taken to accurately represent the intricate geographies of Cape Horn with its several islands, in addition to his discoveries in the Southern Ocean, as well as other important sealing places along the Eastern Patagonian coast and the Falkland Islands. Moreover, the chart creates a visual representation of the region, tying the newly discovered places to the geographies of the SEP.

Recently, there have been claims that some of Weddell’s maps were in fact copies taken from other sealers. In particular, the map of the southern pole (Fig. 2.3) has been considered a copy of the US captain Nathaniel Palmer’s depiction of the Antarctic Circle. According to Simon Garfield, Weddell would have changed the names of over twenty places in order to “include his sponsors, colleagues or friends. So, Spencer’s Strait became English Strait, Sartorius Island became Greenwich Island, and Gibbs Island became Narrow Island”,\textsuperscript{344} removing the US expedition’s names and former locations names in favour of his sponsors. Even though these claims may be correct, it does not lessen Weddell’s contribution to the knowledge of the geographies of the southern latitudes. On the contrary, the incorporation of this chart to his published account, further supports Weddell’s depiction of the region as it visually integrates Cape Horn, the Southern Atlantic Islands, and its navigation across the Antarctic seas to the

\textsuperscript{342} Weddell, 43.
\textsuperscript{343} Weddell, 37.
global representations of the southern latitudes, largely unknown to western audiences. Furthermore, this chart makes explicit the results of his explorations, especially as it showcases the non-existence of land beyond 73 degrees southern latitude, which is presented as a new and original contribution to the geographies of the Southern hemisphere. Significantly, in the publication, this chart was paired with a similar cartography depicting the geographies of the Arctic Circle. This is interesting as it suggests that Weddell aimed to present his endeavours in the southern latitudes as just as valuable and important as the explorations of the Arctic Ocean conducted by recognised contemporary explorers, such as Sir John Ross. Moreover, he is linking his discoveries to a history of polar exploration enterprises, entangling his knowledge to the existing corpus of knowledge of the Arctic and Antarctic geographies.
Fig. 2.2: James Weddell, *Chart of the tracks of the vessel Jane and Beaufoy in their Southern Voyages of Investigation in 1820, 1821, 1822, 1824 & 1824.* (1825) Courtesy of the Linda Hall Library.
Just as with Colnett, Weddell’s experience was confronted with the previous imagined geographies of the SEP. This was the case with Aurora Islands, a group of islands supposedly located in the South Atlantic. These islands appeared in Spanish accounts and maps after the Hispanic expedition commanded by Alexander Malaspina (1789-1794) and had been incorporated into European charts. Motivated by these discoveries and the credibility of Malaspina’s scientific expedition, the sealer sailed towards these islands, only to find that they did not exist. According to Weddell, the addition of these islands to British maps represented a great hindrance to navigation. By quoting the experience of another British mariner who, in his attempt to avoid these islands delayed his passage around Cape Horn for at least a day.

345 Weddell, A Voyage towards the South Pole, 61.
346 Weddell, 61.
347 Weddell, 61.
Weddell wanted to highlight the necessity of clarifying the mystery of the existence of these Spanish islands. After navigating at the same latitude as Malaspina and surveying the area with different instruments, Weddell concluded that the discoveries must have been influenced by the appearances of three reefs which could have been mistaken for islands or, alternatively, that the Spanish crew mistook icebergs for islands. This confusion was highly criticised by Weddell, who argued that if these rocks (known as the Shag Rocks) were the famous Aurora Islands, that would mean that the Spanish mistook their location by six degrees of longitude, which needed to be rectified immediately. According to Weddell, asserting the non-existence of the Aurora Islands was an important contribution to the understanding of the maritime region, leading to a quicker and more secure passage from the Atlantic to the Pacific Ocean for British vessels.

The production of new knowledge of the geographies of the SEP was at the centre of Weddell’s account. For example, he carefully described the main geographical features of the South Shetland Islands, emphasising relevant aspects such as the composition of the soil. He also remarked upon the lack of knowledge about the Patagonia region. In order to contribute to its knowledge, Weddell examined this landscape, differentiating the west coast, depicting it as rocky, high, and rugged, from the eastern coast, portraying it in a more benign way as open for anchoring vessels and sealing activities for it has many “deep and fine bays”. Furthermore, in East Patagonia, Weddell was able to survey and chart the shores and rivers. The small and remote Ildefonso and Diego Ramirez Islands were also important part of his exploration’s plan. Weddell analysed their geological composition, highlighting its volcanic nature. Understanding the novelty of his findings, Weddell collected rocks of these places which were deposited at the Edinburgh College Museum, city where he resided.

The description of these geographies was framed in Weddell’s search for hunting places. Hence, where to find seals and how to navigate towards them was a central part of his account. For example, in his description of the South Shetland Islands, Weddell emphasised the abundance of “amphibious creatures”, particularly fur and elephant seals. In this place Weddell and his crew killed over two thousand elephant seals, remarking how the numbers of

348 Weddell, 72–74.
349 Weddell, 74.
350 Weddell, 133.
351 Weddell, 199.
352 Weddell, 209.
353 Weddell, 169.
354 Weddell, 134.
fur-seals were even higher. Furthermore, Weddell’s account contributed to the further understanding of these animals. He argued that naturalists’ accounts only highlighted the peculiarities of the *Phoca Falkanica*, especially their form and behaviour, but none of the accounts available to him mentioned the value of their skin. Likewise, Weddell addressed the mistakes made by Commodore Byron’s account about Patagonian seals, highlighting the errors and exaggeration made the British officer. His expertise in the field allowed him to challenge previous knowledge about these animals, correcting assumptions about their longevity. Moreover, he also contributed to a scientific knowledge of the SEP’s fauna.

This is the case for the leopard seal (*Hydrurga leptonyx*) (Fig. 2.4), hitherto unstudied by European naturalists. After seeing these animals in one of the South Orkneys, Weddell sent for the second mate to capture a couple of them in order to create the first depiction of this animal. Although not of the best quality or even a realistic depiction of the leopard seal, this drawing reflects Weddell’s intention of contributing to the natural history of this region. This depiction features the animal’s small head and long neck and body, which characterises and sets apart this species from the other members of the *Phocidae* family. The drawing of the leopard seal was sent to the Edinburgh Museum, where the leading authorities of the institution classified it a new type of *phoca*. Weddell also contributed to knowledge about the behaviour and features of other southern animals such as elephant seals and sea lions, king penguins of the South Georgia Islands, and Patagonian birds like the albatross and the nelly birds. Weddell’s contribution was not limited to hydrography and geography; he expanded the knowledge of the region also in the field of natural history.

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355 Weddell, 134.
356 Weddell, 137.
357 Weddell, 140.
358 Weddell, 23.
359 Weddell, 85; 134–137.
360 Weddell, 198–99.
361 Weddell, 55–56.
362 Weddell, 59.
Following the example of Byron and Cook, Weddell also contributed to the knowledge about the inhabitants of Tierra del Fuego and East Patagonia. As Marcelo Mayorga has remarked, sealers’ accounts have contributed to important ethnohistoric information about the Patagonia region. In his published account, Weddell narrated their encounter with the different tribes of Tierra del Fuego, describing their physical features, gender relations, and social behaviour. His account also featured the exchanges between the crew and the local inhabitants. At Tierra del Fuego, Weddell purchased a canoe from them and in exchange he gave them “two barrels of hoops.” As the Spanish American expeditions to the Patagonian channels, Weddell benefited from indigenous naval technology. The sealer understood that the Fueguian canoes were useful for exploring and charting the coast of these islands, as well as for sealing. The contact with these communities proved to be very relevant, as it allowed Weddell and his crew to explore and hunt animals in these intricate geographies and to navigate shallow waters. Ultimately, Weddell’s narrative presents valuable information about European-indigenous contact: exchange of presents, commercial transactions, and rituals. Furthermore, it shows the

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363 Mayorga, “Actividad Lobera,” 42.
364 The account is not clear on how these hoops looked like and what was their utility; however, it refers to them as utensils. See, Weddell, *A Voyage towards the South Pole*, 162.
role played by indigenous communities and their knowledge and technologies in the production of geographic knowledge of places little-known to European explorers.365

The reception of Weddell’s published account was very positive by the general public and the maritime and scientific community. The book was reprinted in 1827, only a couple of years after its first publication. The new edition also incorporated a novel essay on the South Pole written by the sealer, and comments from the second voyage written by Weddell’s second in command, Captain Matthew Brisbane, to the South Shetland Islands. In the same year, his book was translated into German, showing the enthusiasm of European readership of voyage accounts to faraway lands. Literary journals, such as The Edinburgh Magazine and Literary Miscellany regarded Weddell’s book as “a most interesting and important production”366 for the nation, valuable to all individuals from philosophers to merchants and seaman. The journal portrayed Weddell’s account as an individual enterprise that contributed to advances in knowledge and science.367 Furthermore, Weddell’s account contributed to reinforcing images of the voyager as a masculine hero, a figure “whose success depended upon bravery and strength, as much as intelligence, skill, and knowledge”.368 According to the journal, Weddell gave “a manly, unadorned detail of the occurrences of the voyage”369 to the South Pole, arguing that the account was “instructive and amusing, present[ing] a view of that part of the world and its inhabitants which has hitherto been little known among us”.370 Furthermore, Weddell’s contribution to the knowledge of the surroundings of Cape Horn and the Antarctic islands granted him a fellowship in the Royal Society of Edinburgh in 1827, validating his credentials as an explorer in front of the scientific community.

Weddell’s account shows the increasing process of commodification of the SEP and the Antarctic islands in the early-nineteenth century. By producing a narrative based in a natural history approach, Weddell assigned knowledge value to different geographies and locales, emphasising particular hydrographic, geographic, and ecological features, such as the existence of natural resources like water, timber, and animals. In this framework, the narrative, highlights the instrumental perceptions of nature by sealers, who understood the waters of the SEP as a space to exploit and gain profit from. Notwithstanding, the overexploitation of southern fauna

365 For reference, Safier, Measuring the New World.
366 The Edinburgh Magazine and Literary Miscellany XVII (December 1825): 690.
367 The Edinburgh Magazine, 690.
368 Schell, The Sociable Sciences, 56.
369 The Edinburgh Magazine, 690.
370 The Edinburgh Magazine, 694.
was highly criticised by Weddell. He calculated that during 1821 and 1822 sealers had taken about 320,000 seals and produced about 940 tons of elephant seal oil.\textsuperscript{371} He argued that a system of extermination was practised in the South Shetland Islands, which had almost led to the disappearance of the fur seals over the course of as little as two years.\textsuperscript{372} According to him, no less than 20,000 tons of the elephant seal oil were procured for the London market alone.\textsuperscript{373} Concerned about the overexploitation of this animal resource, Weddell promoted a control system like the one practised by the government of Montevideo on Lobos Island.\textsuperscript{374} Regardless of these recommendations, elephant seals and fur seals were almost extinct by the early 1820s,\textsuperscript{375} after a couple of years of exploitation. The commodification of these islands and the animals that inhabited them was quick and voracious. As Igler has identified, fur seals became a good so scarce in some of these southern islands that, by 1802, “sealing voyages would bypass the Juan Fernandez islands altogether”.\textsuperscript{376} The carnage over the SEP islands meant an almost complete slaughter of fur seals, sea lions, and elephants seals within a couple of decades. This was a dramatic outcome of the changing relationship between human and nature. Only in recent decades, fur seals and elephant seals populations have begun to increase, but their numbers are still estimated to be very few in comparison to the population that existed prior to their exploitation.\textsuperscript{377}

James Weddell’s enterprise is recognised today as equally important as other contemporary scientific endeavours, such as the expeditions of the North Americans Benjamin Pendleton and Nathaniel Palmer, and the French Captain Dumont d’Urville in the exploration of southern latitudes. By searching for new places to hunt animals, sealers like Weddell travelled further south than anyone before in pursuit of their prey. They produced new knowledge about little-

\textsuperscript{371} Weddell, \textit{A Voyage towards the South Pole}, 141.
\textsuperscript{372} Weddell, 142.
\textsuperscript{373} Weddell, 53.
\textsuperscript{374} Weddell, 142.
\textsuperscript{375} Weddell, 53.
\textsuperscript{376} Igler, \textit{The Great Ocean}, 115.
\textsuperscript{377} The Chilean National Forestry Corporation -CONAF- \textit{[Corporación Nacional Forestal]} in charge of the Chilean National Parks, estimates a great increase in the population of sea elephants in the last decades in Juan Fernández archipelago. According to the institution from 1990 to 2018, this animal population rose 800%. “CONAF,” accessed March 10, 2021, \url{https://www.conaf.cl/guardaparques-conaf-confirmaron-gran-aumento-de-poblacion-del-lobo-fino-de-juan-fernandez/}. In Western Patagonia, in the Magellan region, studies suggest that the increase of the population furs seals and sea elephants has been slower. See, Claudio Venegas, \textit{Cuantificación poblacional de lobos marinos en la XII región}. (Punta Arenas: Universidad de Magallanes, Instituto Patagonia, 2001). However, in other areas of the SEP, the number of fur seals and sea elephants has decreased or has stabilised in the last few decades due to anthropic pressures derived mainly from industrial fishing. See, María Alejandra Romero et al., “Solapamiento Trófico entre el Lobo Marino de un Pelo Otaria Flavescens y la Pesquería de Arrastre Demersal del Golfo San Matías, Patagonia, Argentina,” \textit{Latin American Journal of Aquatic Research} 39, no. 2 (2011): 344–58.
explored geographies such as Tierra del Fuego and the Desventuradas Islands. British sealers connected these hitherto peripheral places to imperial geographies and commercial networks. Furthermore, they promoted a change of the perception of the sea, framing it as a space of exploitation and commodification.

**Spanish American responses to the commodification of the sea**

In the late decades of the 1700s, Spanish officials in the American colonies constantly received news about the presence of sealers and whalers navigating the SEP waters. In November 1792, for example, an English whaler was detained by the local authorities as it landed at Juan Fernández Island. The captain of the ship claimed to have travelled for about eighteenth months pursuing animals to hunt across the Pacific Ocean. This news alarmed the government officials, as the captain stated that they had over three thousand seal skins taken from Más Afuera Island and that there were about fifty English vessels navigating across the South Sea with the aim of hunting whales. This news circulated widely among the colonial authorities of Chile, Lima, and La Plata. In 1789, for example, the viceroy in Buenos Aires informed the governor of Chile, Ambrosio O’Higgins, of news about an English factory of sperm whale oil in Puerto Deseado in East Patagonia. These reports triggered great concern among the colonial officials, who feared the creation of British settlements in the southern islands.

According to Pereira Salas, from 1793 to 1800 the presence of whalers and sealers in Chilean waters became common and very unpleasant for the Spanish authorities who did not know how to deal with them. Unlike the metropolitan authorities in Spain, who after the San Lorenzo Treaty lost political dominion over the Pacific Ocean, the officials in Spanish America were worried about the local implications of sealers and whalers’ activities. The officials were concerned about the effect on regional and local commerce, the possibilities of contraband, and sought the creation of mechanisms to reinforce the Spanish monopoly in the region, as Ramiro Flores has

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380 A reserved letter sent by the Viceroy of La Plata, marquis of Loreto, on June 1788 to the governor of Chile, Ambrosio O’Higgins, said that there were suspicious of the creation of an English colony in Staten Island (Isla de Los Estados). Referenced by Vicuña Mackenna, 346–48.
381 Pereira Salas, *Los primeros contactos*, 69.
demonstrated. But also, they were concerned about how to take advantage of the fishing and hunting enterprises.

As discussed above, US and British whaling and sealing activities changed human relationships with the SEP. They promoted the commodification of this environment, creating new images where sea animals, particularly their oil, skin, and bones became goods to exploit and trade. This process had profound consequences for Spanish America during the Age of Revolutions, particularly for the geographical imagination of the seas. This section argues that the active presence of whalers and sealers in the SEP stimulated local projects of fishing and hunting, deepening the process of nature’s commodification.

During the nineteenth century, the transformation of natural elements, such as minerals, forests, and animal skins into commodities became the cornerstone of Latin American economies, reinforcing and consolidating a process that had started in the colonial centuries. As George Cushman has argued, “Northerners’ quest for whales and other marine resources played a decisive role in opening vast stretches of this oceanic realm to exploitation by outsiders after 1800. The independence of Latin America helped clear the way for these endeavours.” By the 1820s, Spanish American ports were open to free trade, a situation beneficial to American and European whalers and sealers who started to dock their vessels in South American ports like Talcahuano, Valparaíso, and Paita, generating new commercial opportunities for these cities. In this context, as Helen Cowie has acknowledged, “animals have shaped the cultural, social, and economic development of Latin America and have left an indelible imprint on human societies.” The hunting of whales, seals, and other fishing enterprises in the SEP make very good cases to explore this idea.

The first case study pertains to the conger eel fisheries established in the colony of Chile in 1789 by the governor, Ambrosio O’Higgins. Concerned by the idea of other European nations navigating Spanish waters and taking advantage of the natural richness of the ocean, O’Higgins decided to foster projects of local exploitation of marine resources, namely conger eels, in the northern region of Coquimbo. Despite some serious problems concerning the lack of timber to

382 Sagredo and González, La Expedición de Malaspina, 770–72; See also Flores, “Los balleneros anglo-estadounidenses.”.
383 Cushman, Guano, 16.
build vessels and the scarcity of experienced sailors, O’Higgins was confident that the exploitation of the conger eel would make these provinces prosperous. Local fishing communities, particularly Chango people (coastal indigenous communities) already exploited and sold conger eels. Taking into consideration this local experience, O’Higgins wanted to exploit and commercialise this resource at a larger scale. The implementation of the project led to the mobilisation of resources from all over the colony: timber from the southern provinces, skilled workers to build the vessels from Valparaíso, and the expert guidance of Spanish members of the scientific expedition led by Alexander Malaspina. O’Higgins argued that despite certain problems, the Coquimbo region had great potential for building a strong maritime commerce because of the existence of the main resources: fish of great quality. Additionally, he believed that having a strong local fishing industry could have great advantages for the security of the colony, arguing how a sizable sailor community could generate international respect.

O’Higgins’ conger eel project shows how the commodification of nature in Spanish America was not only a terrestrial affair. Stuart McCook has demonstrated the ways in which Spanish American governments during the eighteenth and early-nineteenth centuries sponsored the study of landscapes in order to foster the development of certain key crops. The case of the conger eel project expands these considerations into marine environments. Furthermore, this case illustrates the changing attitudes and representations of the Spanish Americans about the oceans and marine fauna in the late colonial period. With this project, O’Higgins was able to expand the idea of nature as a space full of resources for humans to exploit to the sea.

Another case that explores a similar idea is the creation of whaling projects in Chile and other places of South America. Traditionally in Chile, the indigenous people and mestizos who inhabited the coast used whale oil and bones in their daily lives. Usually, their contact with whales was made on the beach when the whales became stranded. Therefore, hunting them was not part of indigenous or Chilean traditions during the colonial period. In spite of this, the

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386 Sagredo and González, La Expedición de Malaspina, 681.
387 In a letter to Tomas Shee, O’Higgins named José Joaquin Ostolaza, who lived in Valparaíso, to help in construction of the vessels. Archivo Histórico Nacional, Fondo Capitanía General, vol. 780, f. 332. Ambrosio O’Higgins to Tomás Shee, October 20 1789.
389 AHN, Fondo Capitanía General, vol. 780, f. 332.
391 Cartes, Los cazadores de Mocha Dick, 24.
presence of whales, but more importantly, the actions of European and North American whalers motivated the creation of several projects in the South American colonies in order to promote their own hunting enterprises in the late 1700s. These projects usually promoted the occupation of frontier spaces like East Patagonia or peripheral places such as the Pacific islands. For example, in his observations about the South Atlantic and South Pacific Patagonian coasts, naval officer, Alexander Malaspina, argued in favour of promoting whaling activities. As he assessed the region and received notifications of increasing presence of foreign whaler vessels, Malaspina suggested that whaling and fishing were perhaps the only economic activities from which Spain could gain profit in this region. In his narrative, the officer had created a very negative view about Patagonia’s nature, depicting it as a void; however, the marine natural resources were highlighted as the main possible commodities. As Malaspina’s journal shows, fishing became a common theme in enlightenment discourses about taking advantages of nature and trade, particularly relevant for the progress of places such as Chile and East Patagonia, which were considered peripheral in the commercial networks of the Spanish empire.

In 1789, the Spanish crown founded the Real Compañía Marítima de Pesca as a response to the increasing presence of American and other European powers in the South Atlantic and South Pacific. According to the royal decree, the company’s objective was to fish in the Spanish domains of Europe, Africa, and America, as well as to hunt whales. The creation of this company was an attempt by the Spanish crown to maintain the monopoly over trade and navigation in the Pacific and their nominal imperial territories. Even though the company had privileges allowing it to fish and hunt in the African, American, and European coasts, the hunting activities were practised on the coast of Río de la Plata, with bases in Maldonado and Puerto Deseado in East Patagonia. Moreover, local authorities in River Plate had for years argued for the benefits of creating settlements in East Patagonia (interior lands) which could be supported by the exploitation of local resources, mainly salt, fishing, and hunting activities. Following the orders of the Crown minister Floridablanca, the colonial administration created four new settlements in Patagonia between 1778 and 1784. However, these projects were not very successful, closing shortly after their creation. After the dismantlement of the settlement

393 Antonio Sañez Reguart, Diccionario histórico de los artes de la pesca nacional (Madrid: Imprenta de la viuda de Don J. Ibarra, 1792), 344.
394 In Puerto Deseado, the colonial settlement was created in 1780 and was dismantled only a year after in August 1781. The Floridablanca Fort and settlement, in San Julián coast, operated three years, from January 1781 to
in Puerto Deseado, local officers urged the Crown to reopen it, arguing the necessity of having colonies in this remote landscape as the foreign presence in the region had augmented significantly as US and British whalers were starting to hunt the southern Atlantic waters. In a 1783 letter to Floridablanca, Basilio Villarino, colonial officer and local pilot, argued about the benefits of whaling for local commerce, highlighting the abundance of whales and other marine animals in the region, pleading the Crown to promote this activity in the colonised area.

By the end of the century, the company “hunted tens of thousands of sea lions along the Patagonian littoral”, but the cost of the operations, along with the pressure over the Patagonian colony, led to the increasing cost of the production of whale and seal goods. By July 1803, the Spanish government ended the business.

Other projects and attempts at whaling on the Pacific coast emerged by the end of the eighteenth and early-nineteenth centuries. In 1801, El Callao trader Francisco Saenz Ruiz received permission to hunt whales and manufacture candles for the Compañía española de pesca de ballena de Lima for ten years. Saenz Ruiz’s idea was to take advantage from the position of Lima and from there start to hunt for the whales that inhabited the South Pacific. Similar thoughts rose among Chilean authorities. In his report to Malaspina, the regidor of Santiago and Treasurer General of Chile, Juan José de Santa Cruz y Silva (1733-1803), believed that mining and fishing should be bolstered to promote progress in the colony. In regards of fishing, Santa Cruz explained that Spain was a great consumer of whale oil and that the British hunt the whale in Spanish domains at great cost of money and time to later sell it to Spain; Chileans, he argued, could hunt these animals from their own coast without having to navigate many leagues into the sea. They could achieve this with small vessels and they could build a factory to get the oil from the whale and then send it to Spain. For Santa Cruz, the promotion of fishing would mean that money from whale products would stay in Chile instead of passing to British hands. His idea was to create a local business that would take advantage of local resources.

398 AHN, Fondo Claudio Gay, Vol. 33, pieza, 6, f. 48
399 Sagredo and González, La Expedición de Malaspina, 489–90.
Santa Cruz’s analysis of the Chilean economy and how to take advantage of nature was in line with other governmental authorities such as O’Higgins. However, a big difference was that the governor thought that whaling should be left for the future. He argued that even though whaling was a great field for the utility of the commerce of these countries, Chile and the other South American colonies were located too far away from the European markets.\textsuperscript{400} For O’Higgins, this distance represented a serious hindrance for a successful commerce of this type of goods, as these countries did not have the capabilities to transport or process the animal products. He remarked instead that it was necessary for these colonies to master the arts of fishing first, hence why he promoted the conger eel fishing.

Projects to exploit whales re-emerged during the first years of the republican period. In 1819, the Chilean merchant Antonio Arcos, along with the American Charles Wooster and the British merchant William Henderson, organised a whaling society based in Coquimbo to operate on the coasts of the newly independent country.\textsuperscript{403} A couple of years later, in 1830, Robert Thompson with his brig, \textit{Buen Suceso}, devised another whaling business based on Valparaíso. This project was publicised in the local newspaper \textit{El Mercurio de Valparaíso} as an enterprise of great utility to the individuals involved and to the fatherland.\textsuperscript{402} Thompson was searching for business partners to start a local whaling company. To attract them, he strongly argued about the strategic position of Chile, highlighting its optimal location for conducting this type of enterprise, particularly when compared with Europe and the United States. A Chilean brig could reach whaling locations in a matter of days, while European and North American vessels could take a month.\textsuperscript{403} Thompson also planned to establish a candle factory in order to process sperm whales oil, creating candles at lower prices and to satisfy the local demand.\textsuperscript{404} By 1835, \textit{El Mercurio de Valparaíso} published another whaling enterprise, this time led by Guillermo Thompson.\textsuperscript{405} Little is known about Robert and Guillermo Thompson’s business attempts; Chilean historiography has regarded these attempts as failed whaling projects.\textsuperscript{406}

Although these projects did not prosper, they reflected the contemporary idea of creating local industries in order to exploit and profit from what was considered a local resource. These

\textsuperscript{400} AHN, Fondo Capitanía General, vol. 780, fj. 334.
\textsuperscript{401} Daniel Quiroz, \textit{Cazadores clásicos de ballenas en las costas de Chile (1819-1921)} (Santiago de Chile: Dirección de Bibliotecas, Archivos y Museos, 2015), 2.
\textsuperscript{402} El Mercurio de Valparaíso, 9 October 1830.
\textsuperscript{403} El Mercurio de Valparaíso, 7 September 1830.
\textsuperscript{404} El Mercurio de Valparaíso, 7 September 1830.
\textsuperscript{405} El Mercurio de Valparaíso, 8 October 1835
\textsuperscript{406} Cartes, \textit{Los Cazadores de Mocha Dick}, 36; Daniel Quiroz, “Balleneros en la niebla. Antropología e Histórias de la caza de ballenas en la costa de Chile” (Santiago de Chile, Universidad de Chile, 2013), 66.
projects also might shed some light on early manifestations of economic nationalism, as they promoted the national production of commercial goods, working in opposition to more liberal positions that emphasised the openness of the Chilean markets in the 1820s and early 1830s.\footnote{Eduardo Cavieres, \textit{Comercio chileno y comerciantes ingleses 1820-1880: Un ciclo de historia económica} (Valparaíso: Universidad Católica de Valparaíso, 1988); William Sater, “Nacionalismo Económico y Reforma Tributaria a Fines Del Siglo XIX En Chile,” \textit{Estudios de Economía} 18, no. 2 (1991): 216–44.} Even though the Chilean economy embraced liberal policies very early on when compared to other countries of the region, discourses of promotion of local whaling industries continued to appear in the public sphere.\footnote{Simon Collier and William Sater, \textit{Historia de Chile 1808-1994} (Madrid: Cambridge University Press, 1999), 64.} For example, the newspaper \textit{El Mercurio de Valparaíso} kept publicising and promoting the advantages of whaling enterprises across the SEP, describing local hunting places such as Mocha Island, and the method by which to conduct this activity, all through the 1830s.\footnote{El Mercurio de Valparaíso, 12 July 1834 and 6 September 1836.} By the mid-nineteenth century, Chilean ties with whaling and sealing industries grew stronger. According to Quiroz, between 1830 and 1860 there were many whaling initiatives that involved Chilean capital and labour, of which the most relevant was Casa López y Sarto, a company formed by merchants from Valparaíso in the early 1850s.\footnote{Quiroz, “Balleneros en la niebla,” 66.} Likewise, in 1843, Chilean and foreign investors organised a sealing project based on Concepción.\footnote{AHN, Fondo Fernández Larraín, vol. LII; pieza 15. \textit{Letter to Juan Thomas from Pedro de Zañartu.}} By the 1870s, these initiatives prospered, and local companies started to exploit whales and seals from the surrounding Chilean waters, fulfilling what had been envisaged for decades.

The commodification process of the SEP started by British and US whalers and sealers prompted the exploitation of other natural resources. As Cushman has argued, whaling established a new ecological relationship with the Pacific environment, opening it to the exploitation of other resources such as guano in the 1840s and nitrate deposits in the second half of the 1800s.\footnote{Cushman, \textit{Guano}, 41.} This demonstrates the long-lasting impact of sealers and whalers’ images of the SEP as a space to exploit and profit from. Likewise, it expands the ideas of the commodification of nature in Spanish America to coastal and marine environments - processes that have been studied by historians for decades but primarily through a terrestrial lens.
The southern whales and the challenges to European natural history

The American author Francis Olmsted (1819-1844) wrote in his book on whaling that “the appearance of the whale as represented in most works of natural history, is extremely inaccurate, and no one would suspect for what it was designed, unless it were labelled”.\footnote{Francis Olmsted, *Incidents of a Whaling Voyage. To Which Are Added Observations on the Scenery, Manners and Customs, and Missionary Stations of the Sandwich and Society Islands, Accompanied by Numerous Lithographic Prints.* (New York: D. Appleton and Co., 1841), 61.} The lack of accuracy in the depictions of whales motivated him and other surgeons on board whaling vessels to create natural history accounts about whales and other marine animals. This section addresses the contribution of medical practitioners on board whaling ships to the knowledge of the natural history of the South Sea. Even though what they wrote did not specifically address the animals of the SEP, they contributed to further scientific understanding of southern hemisphere fauna. In the same vein, I also discuss the contribution of Spanish American naturalists, namely the Chilean Juan Ignacio Molina, to the scientific knowledge of SEP whales. Both, surgeons’ empirical knowledge on board whaler vessels and Molina’s research and field observations challenged previous conceptions of European naturalists about American mammals.

Historians of science have paid little attention to the role of surgeons and medicine practitioners on board whaling ships, particularly with regards to their contributions to scientific knowledge. Honore Forster has remarked that British surgeons were established members of the crew of British “whaleships in both the Northern and Southern whale fisheries”.\footnote{Honore Forster, “British Whaling Surgeons in the South Seas, 1823–1843,” *The Mariner’s Mirror* 74, no. 4 (1988): 403.} Forster has remarked on the way in which the presence of doctors on board of a whaleship was part of British maritime legislation, making their presence a norm rather than an exception.\footnote{Forster, 403–4.} This view has been contested by Martin Evans who has argued that there were no statutory requirements to carry doctors on board whaleships, as Forster has stated, but that it was compulsory only in northern fisheries.\footnote{Martin Evans, “Statutory Requirements regarding Surgeons on British Whale-Ships,” *The Mariner’s Mirror* 91, no. 1 (2005): 9–10.} Regardless of this, it became a common practise to take doctors on board whaling vessels that navigated through the Pacific Ocean. Several of them recorded their experiences and observations. According to Forster, these surgeons had a certain degree of education and scientific training. Some of them kept journals, through which they revealed awareness and interest in the people and places they visited, as well as showing “their ability...
to write about what they saw with some precision and skill”\textsuperscript{417} In doing so, they reproduced many preconceptions about the societies and the environment of the Pacific, but they also challenged previous knowledge, particularly in the field of natural history.

One of these accounts was written by Frederick Bennett (1806-1859), a fellow of the Royal College of Surgeons of London. Bennett’s work epitomises the contribution of physicians and surgeons to the knowledge of the natural world of the Pacific basin, as he addressed the peculiarities of the flora and fauna of this landscape. Bennett spent three years navigating the Pacific on board the ship \textit{Tuscan} (1833-1836). In his 1840 published account of the voyage, he described the events of the trip and the places that he visited around the globe. In addition, Bennett incorporated a zoological and botanical appendix, describing the different kinds of animals and plants that he encountered. In the account’s introduction, Bennett declared that his aim was “to investigate the anatomy and habits of Southern whales, and the mode of conducting the sperm whale fishery (a subject untouched by the literature of any country)”,\textsuperscript{418} as well as to describe the state of Polynesia and other lands, and to gather fauna and flora samples for the development of natural history. As a result of his endeavours, Bennett and company brought 743 dried specimens of plants and 233 preparations of animals to London.\textsuperscript{419} The botanical material was handed to local naturalists, while the zoological collection was deposited in the Hunterian Museum of the Royal College of Surgeons in London.\textsuperscript{420}

Bennett’s greatest contribution was to the knowledge of cetaceans and whales of southern oceans, a subject that had been scarcely studied by the early-nineteenth century. He described the common characteristics among the cetaceans and the ways in which they differ from terrestrial animals, particularly quadrupeds.\textsuperscript{421} Bennett also discussed the classification of whales, paying particular attention to the specie of sperm whales. He characterised sperm whales as the “most valuable of the southern whales” for the whaling industry.\textsuperscript{422} One of his most important contributions was his recognition of the existence of only one species of sperm whale, as he pointed out that previous accounts did not describe with accuracy the main features of the ordinary sperm whale.\textsuperscript{423} Thus, Bennett’s aim was to describe sperm whales’ size, form,

\textsuperscript{417} Forster, “British Whaling Surgeons,” 403.  
\textsuperscript{418} Frederick Debell Bennett, \textit{Narrative of a Whaling Voyage round the Globe from the Year 1833 to 1836: Comprising Sketches of Polynesia, California, the Indian Archipelago, Etc. With an account of Southern Whales, the Sperm Whale Fishery, and the Natural History of the Climates Visited}, vol. I (London: R. Bentley, 1840), v.  
\textsuperscript{419} Bennett, I: viii.  
\textsuperscript{420} The account mentioned A. B. Lambert and Professor Don; Bennett, I:viii.  
\textsuperscript{421} Bennett, I:151–52.  
\textsuperscript{422} Bennett, I:153.  
\textsuperscript{423} Bennett, I:154.
colours, and bone structure, among other features.\textsuperscript{424} In his effort to describe a clear and accurate depiction of the sperm whale, Bennett examined the corpse of a pregnant female whale, removing the foetus from the womb in order to analyse it.\textsuperscript{425} Bennett’s account also depicted the habits, geographical distribution, and habitat of this species.

Bennett’s work helped to popularise the knowledge of the southern whales and the whaling industry in Britain. The English periodical \textit{Monthly Review} published a review of the account, emphasising Bennett’s contribution to a field of natural history “not often investigated”,\textsuperscript{426} particularly addressing his physiological and anatomical description of the sperm whales. The periodical also praised Bennett’s depiction of the whaling process,\textsuperscript{427} highlighting the extremely dangerous conditions of this activity. While Bennett’s work is highly descriptive in terms of the anatomy of the cachalot, Thomas Beale’s book, \textit{Few Observations on the Natural History of the Sperm Whale}, is more analytical, as it challenged previous assumptions regarding the sperm whales of the Pacific.

Thomas Beale (1807-1849) was a British surgeon who joined the crew of the whaler vessel \textit{Kent} in October 1830. After returning to England, Beale wrote a brief pamphlet on the natural history of the spermaceti whale in 1835. Due to its success, Beale decided to transform this pamphlet into a book, which was published a couple of years later in 1839. The object of the book was to describe the anatomy and physiology of the sperm whales. According to Beale, these animals were “subjected to constant misrepresentations”,\textsuperscript{428} resulting from the compilation of information and sources of an inaccurate or false nature.\textsuperscript{429} Beale’s aim was to create accurate knowledge of these animals and, subsequently, to inform about the fishing activities of the South Pacific and the products of the hunt for sperm whales.\textsuperscript{430} By doing this, Beale contradicted the authority of prestigious naturalists, particularly the remarks published by George and Frederick Cuvier. For Beale, the navigating experience on board of a whaler vessel for several years gave him the authority to draw a more reliable account of the Pacific whales.

\textsuperscript{424} Bennett, I:154–67.
\textsuperscript{425} Bennett, I:167.
\textsuperscript{427} Griffiths and Griffiths, 277.
\textsuperscript{428} Thomas Beale, \textit{The Natural History of the Sperm Whale. to which is added, A Sketch of a South-Sea Whaling Voyage} (Holland press, 1839), 1.
\textsuperscript{429} Beale, 1.
\textsuperscript{430} Beale, 2.
In his account, Beale argued that naturalists had been mistaken about what the sperm whales eat, as well as their size, form, anatomical features, breathing mechanism, and behaviour. One of the aspects that had received much attention was the alleged ferocity of the animal; previous accounts characterised the sperm whales as aggressive. The renowned French zoologist George Cuvier insisted on the idea that sperm whales eat other kinds of whales. On the contrary, Beale portrayed these animals as “huge but timid” and anatomically incapable of swallowing such big animals. To back up this argument, Beale relied on his experience, often highlighting what he witnessed in different parts of the Pacific, such as Japan and the SEP. From his perspective, his experience in the field was what made his knowledge legitimate and, therefore, useful for future naturalists’ accounts.

Another characteristic that Beale wanted to demystify was the idea that sperm whales produced lurid groans when they were under attack. Instead, he presented the sperm whale as “the most noiseless of marine animals”. In his analysis, Beale concluded that this idea propagated by prestigious naturalists such as George Cuvier and Abbe Lecoz, must have resulted from mistaking the sperm whale for the common Greenland whale, which produces loud sounds. Recent research has denied this information, highlighting the importance of the sound emitted by sperm whales as their main communication tool. Despite this significant error, what is relevant in Beale’s interpretation is the way in which he insisted on the different features of the sperm whales and how this species had unique and distinctive characteristics not found in other cetaceans.

One of the most controversial topics as regards the natural history of the sperm whale was its classification into species and families. The classification and the existence of different types of sperm whales were widely discussed during the eighteenth and early-nineteenth centuries, as Thomas Beale noted. Authorities in natural history such as Carl Linnaeus or Mathurin Brisson claimed the existence of at least six species of sperm whales. After analysing their anatomical features, their habits, and social behaviour in various parts of the world, Beale asserted that there was “no more than one species of sperm whale”, confirming what Cuvier had said. Even though he was cautious about criticising the authority of these acclaimed

431 Beale, 16.
432 Beale, 7.
433 Beale, 3.
435 Beale, 10.
436 Beale, 12.
naturalists, Beale challenged their premise, arguing that the misconceptions regarding the different types of cachalots “may have arisen from the great disproportion in size which exists between the male and female”. 437

Contemporaries assessed Beale’s account as “one of the most valuable contributions we have received towards the history of this curious and very imperfect known race of animals”. 438 The Magazine of Natural History, for example, valued Beale’s contribution concerning the anatomical features of the animal and its habits, which coincided with Bennett’s observations. 439 The Quarterly Review stressed the economic advantages of whaling for the British industry, while also highlighting the valuable contribution of Beale’s work to the understanding of sperm whale’s features, particularly his observations regarding its breathing system, the animal’s social behaviour and communication system. 440 The journal The Athenaeum publicised Beale’s book as “the only work on a subject of much national importance, and the only account on whaling as practised in the South Sea”. 441 The positive reception of Beale’s research by these publications highlights the social importance attached to these hunting and voyage accounts, which aimed to boost British commercial and imperial projects around the globe.

Beale’s work represents the first attempt to characterise this species about which very little had been previously known. As the Annals of Natural History explained, Beale’s account corrected many suppositions about sperm whales’ habits. 442 In the same vein, the Quarterly Review remarked the scarcity of accurate accounts regarding the anatomy and physiology of these animals, and valued Beale’s work as the evidence needed to confirm Cuvier’s ideas on the subject. 443 Importantly, the British reception of his account shows how by the mid-nineteenth century the field of natural history in Britain was opened to contributions from amateur scientific practitioners. Unlike other fields such as mineralogy, natural history endeavours were easy to learn, opening the field to learned people, as Stefanie Gänger has demonstrated. 444

Knowledge about cetaceans was also a subject explored by Spanish American authors. Whales that inhabited the South Sea were studied by naturalists who wanted to research the

437 Beale, 14.
439 Magazine of Natural History, 1839, 250.
440 The Quarterly Review (J. Murray, 1839), 324–25.
441 James Silk Buckingham et al., The Athenaeum (British Periodicals Limited, 1839), 229.
442 Annals of Natural History, Or Magazine of Zoology, Botany, and Geology, 119.
443 The Quarterly Review, 322.
444 Gänger, “Colecciones y estudios” 82.
characteristics and peculiar features of American animals. Motivated by the increasing presence of American and British whalers on the coasts of the Southern Cone and the misconceptions about southern hemisphere marine mammals, Juan Ignacio Molina (1740-1829), a Chilean naturalist, wrote extensively about the subject. First, in his natural history compendium titled *Saggio sulla storia naturale de Chili* (1782), Molina incorporated whales into the long list of animals that inhabited the Chilean coast. The focus on the natural history of whales gave Molina the opportunity to challenge and overthrow the Comte de Buffon’s preconceived ideas on the inferiority of American nature. According to Buffon, American animals were small and stunted when compared to Asian and African ones. They lacked the beauty and majesty of old-world fauna, and nature as a whole was depicted as inferior and backwards. Molina, like other Spanish American intellectuals such as Francisco Xavier Clavijero and Juan de Velasco, wrote their own accounts not only to challenge these visions, but to vanquish them. As Jorge Cañizares-Esguerra has argued, these discourses exposed the shortcoming of Europeans accounts when addressing the history and natural history of the New World.\footnote{Cañizares-Esguerra, *How to Write the History*, 4.}

Using the accounts of British travellers, Molina highlighted the abundance of these animals to refute European misconceptions regarding the southern hemisphere whales. Molina’s aim was to prove the existence of different species of whales in the South Pacific. He argued that both *Balaena Mysticetus* (Bowhead whale) and *Balaena Boops* (*Megaptera novaeangliae* or Humpback whales) were seen by Cook and other travellers during their journey through the SEP.\footnote{Juan Ignacio Molina, *Compendio de la Historia Geográfica, Natural y Civil del Reino de Chile, escrito en italiano por El Abate Don Juan Ignacio Molina. Primera Parte que abraza la Historia Geográfica y Natural. Traducida en español por Don Domingo Joseph de Arquellada Mendoza*. (Madrid: Antonio de Sancha, 1788), 254.} To illustrate how common these animals were, Molina incorporated their indigenous names (*Yene* and *Ycol* respectively), pointing out that these species usually appeared at the mouth of rivers to catch fish.\footnote{Molina, 254.} Additionally, Molina demonstrated the equality between northern and southern whales. In order to do this, the naturalist contended that a huge whale of 96 feet had seen stranded in the Chonos coast and that big whales’ bones – of about 22 feet – appeared on another beach of the same coast.\footnote{Molina, 255.} With these arguments, Molina refuted Comte de Buffon’s denial of the existence of whales in the South Sea and his ideas on the inferiority of southern hemisphere animals.
Historians have often portrayed Molina’s studies as less direct critique or toned-down critique of European views on American history and nature. For example, Cañizares-Esguerra has argued that this was due to the fact that European travellers of the eighteenth century assessed Chilean nature positively, while Charles Ronan has highlighted Molina’s gentlemanly attitudes towards European savants, especially Buffon. These analyses have focused on the content of Molina’s work, a perspective which tends to overestimate Molina’s respect and appreciation for European knowledge. According to Cañizares-Esguerra, Molina “organized his histories of Chile around the testimony of European travellers”. Indeed, Molina heavily relied on European travellers to add credibility to his scientific narrative as he used them as his main source of information and to legitimate his arguments. However, a more detailed analysis of Molina’s methodology might inform aspects of his scientific work hitherto unnoticed.

The lecture on whales delivered by Molina at Bologna’s Academy of Science represents an opportunity to explore Molina’s scientific methodology. This account was published in 1822 in the book entitled Memorie di storia naturale (Treatises on Natural History), along with thirteen other lectures that focused on topics such as geology and natural history. In this account, Molina presented further arguments that supported his ideas about the southern whales, describing their anatomy, physical features, and behaviour. His aim was to present general knowledge about whales, focusing particularly on southern whales, in order to make it public to European audiences. Furthermore, he highlighted the similarities between northern and southern whales, particularly regarding size and abundance, in order to challenge misconceptions about these animals. To do so, Molina used three different strategies. First, as has been recognised by historiography, Molina continually quoted European travellers such as Cook, Feuillé and La Perouse to back up his arguments. Secondly, Molina used his own observations and experiences to add credibility and legitimacy to his arguments, often describing what he witnessed on the coast of Central Chile or while navigating from Chile to Europe. Thirdly, Molina also relied on Hispanic American knowledge and traditions in order to further reinforce his point of view. For example, when talking about a whale’s uses, Molina commented on the ways in which the Araucanians (Mapuche people) used the substance called

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449 Cañizares-Esguerra, How to Write the History, 253.
451 Cañizares-Esguerra, How to Write the History, 253.
ambergris (*mejene* in the Mapuche language).\(^{453}\) This methodological perspective reassesses Molina’s work. It does not obscure the fact that Molina’s critique was built in a “gentlemanly way” towards highly recognised European thinkers, particularly when compared with Clavijero’s more radical approach. Molina used European voices when it was convenient, but he also used other voices, including his own, when it was instrumental to do so.

Molina’s work about the whales of the SEP fits the category of creole patriotism, a discourse which Helen Cowie has identified among Spanish American naturalists as the “desire to correct erroneous information and to advance Spanish science as a whole”.\(^{454}\) Moreover, Molina’s representations of nature were in line with contemporary ideas of the commodification of nature. This can be analysed in the final part of his whale memoir where he dedicates an entire section to the history of whaling in the southern oceans.\(^{455}\) Molina addressed the way in which the North Americans hunted these animals, highlighting the courage and skills needed to conduct this enterprise in the dangerous seas around Cape Horn and the Antarctic.\(^{456}\) By doing this, Molina adopted the idea of nature as a space of resources to exploit and conceived of marine animals as commodities. In his instrumental vision of oceanic environments, Molina encouraged the hunting of whales, as he understood it as an opportunity for the progress of the industry and the education of coastal communities.\(^{457}\) Moreover, this shows how widely accepted were the ideas of commodification of marine environments among Spanish American government officials and intellectuals by the early decades of the nineteenth century.

**Conclusions**

Whaling and sealing activities opened up the SEP to the exploitation of nature and the expansion of global commercial networks. This chapter has argued that British sealers and whalers were active agents in the consolidation of British marine dominion of the Pacific Ocean during the Age of Revolutions. By pushing further south in the Atlantic and navigating into the SEP, whaling and sealing vessels broke the nominal Spanish dominion over these waters, expanding British presence in the area and its commercial networks. They produced new empirical knowledge about little-known regions, such as the coastal lands of Patagonia and the

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\(^{453}\) Molina, 27.


\(^{456}\) Molina, 36.

\(^{457}\) Molina, 37.
While whaling fostered a better practical knowledge of how to navigate the SEP, sealing led to an empirical knowledge of the islands and coastal lands of this region. These actors formed a transnational and informal community, generating new empirical knowledge about this environment, which included the understanding of currents and wind patterns, the location of suitable ports to anchor, and the geographical features of hitherto little-explored islands and bays. Sealers and whalers, such as Colnett and Weddell, produced and disseminated relevant new cartographic and hydrographic knowledge of this maritime region. In their accounts, remote places like Mocha, Staten and Más Afuera Islands were transformed from peripheral places to important hunting sites, linking them to a wider network of commerce and global exchange.

Furthermore, these hunting enterprises transformed the images of the SEP by depicting it as a space to exploit and gain profit. In the late-eighteenth and early-nineteenth centuries the activities of whaling and sealing signalled the starting point of the commodification of the SEP and its coastal lands. Whalers’ and sealers’ voyage accounts depicted the emergence of a new relationship between humans and the environment. These accounts portrayed marine animals, namely sperm whales, fur seals and sea-elephants, as objects of human exploitation. Moreover, they generated long-lasting representations of the sea as a space of resources to exploit and profit from.

In a context of increasing tensions between Spain and Britain, the presence of British sealers and whalers deeply troubled the colonial authorities in Spanish America, as historians such Pereira Salas have already argued. However, as this chapter has demonstrated, their presence also motivated the development of local fishing and whaling projects during the late colonial and the early republican periods in Chile. These initiatives show the changing relation of Spanish Americans with their environment. The local whaling projects, along with other fisheries, deepened the process of the commodification of the SEP and its shores. Marine animals such as sperm whales, conger eel, fur and elephant seals started to be seen as natural resources, and their profitable parts (bones, fat, and pelts) became understood as commodities. This is relevant because it contributes to historiographical research on the commodification of Spanish American nature during the late-eighteenth and nineteenth centuries, expanding the analytical framework towards marine and coastal environments.

The navigation of whalers and sealers across the SEP contributed to further knowledge and understanding of southern hemisphere flora and fauna by western authors. In particular,
surgeons on board of whaler ships also contributed greatly to the study and dissemination of zoological knowledge about southern marine mammals, often challenging renowned authorities in the field of natural history. As this chapter has shown, Thomas Beale and Frederick Bennett’s work actively contributed to the knowledge of southern whales, especially sperm whales. Their research helped to promote and disseminate knowledge about the anatomy and behaviour of these animals, contributing to the enhancement of British knowledge on the natural history of the southern hemisphere. More importantly, their discoveries were based on the experience gained during years of participating in sealing and whaling enterprises. The positive reception of Beale’s work within the scientific community shows the openness of this field to amateurs’ research in the mid-nineteenth century, before the professionalisation of the natural sciences.

Southern whales also became objects of study for Spanish American naturalists. In the case of the Chilean naturalist Juan Ignacio Molina, whales gave him the opportunity to challenge the preconceptions of European savants regarding South American nature. By describing these aquatic mammals, Molina was able to argue against the alleged inferiority of American animals claimed by renowned European naturalists like Buffon. Molina’s work has been often classified as Creole patriotism, a social and scientific discourse of American naturalists whose aim was to correct the mistaken knowledge of American environments and societies. In order to build a credible scientific narrative, Molina usually relied on European travellers as his main sources of information. However, when it was possible and pertinent, he applied his own experience and observations, as well as local knowledge and practices regarding the environment, to strengthen his argument, a practice common among other South American naturalists. Thus, as a Creole patriot, Molina not only produced new knowledge about Chilean nature and its inhabitants, but also validated the knowledge produced locally in the colonies. Additionally, Molina’s scientific narrative engaged with wider social discourses that transformed nature into a field of resources for human exploitation. Molina especially promoted whaling enterprises in American waters, as other contemporary authorities did in Spanish America.

Furthermore, the practical knowledge of sealers about the SEP was recognised by contemporary explorers and hydrographers. Famously, sealers were employed as pilot in the British expedition commanded Robert Fitz Roy in the early 1830s. The Scottish sealer William Low had a crucial role in showing new maritime passages and hitherto uncharted geographies
of the SEP. \textsuperscript{458} The expertise and practical knowledge of sealers and whalers were also used by the Chilean military expedition that took possession of the Magellan Strait in 1843. The leader of the expedition, the British-born naturalised Chilean John Williams (1798-1857), hired two British sealers to accompany him: Charles Miller and John Yates. In his voyage account, Williams addressed the importance of these actors for the Chilean enterprise, pointing out how “a practical man was more valuable than the theory” for the navigation of the uncharted regions of Western Patagonia. \textsuperscript{459} Moreover, William’s report showcases the historical relevance of sealers in the geographical imagination of this region, as they named several sites in Western Patagonia. \textsuperscript{460} Crucially, the expertise of sealers such as Low, Miller and Yates was instrumental to the scientific and military expeditions in the area during the Age of Revolutions. Their empirical knowledge was then translated into hydrographic and cartographic knowledge, becoming crucial agents in the production of British imperial geographies and for the territorial projection of Chile. Moving from these informal knowledge communities, the following chapter will delve into the process of construction of more formal scientific knowledge about the SEP. Specifically, it will focus on the production of hydrographic knowledge and the geopolitics involving science-making. By doing so, chapter 3 will return to the topic of imperial rivalries, addressing the ways in which hydrography became a vehicle for interstate competition between Spain and Britain in the late eighteenth and early nineteenth centuries. Moreover, the next chapter will also explore the local and regional outcomes of knowledge productions, examining how the imperial competition incentivized the emergence and production of Spanish American based knowledge about the SEP, and exploring how this knowledge was transformed into a tool for nation-state building after the demise of the Spanish Empire in the 1830s and early 1840s.


\textsuperscript{459} Nicolás Anrique, \textit{Diario de la Goleta Ancud al mando del Capitán de Fragata Don Juan Guillermos} (1843) \textit{para tomar posesión del Estrecho de Magallanes} (Santiago de Chile: Imprenta, Litografía i Encuadernación Barcelona, 1901), 21.

\textsuperscript{460} Places such as Port Low and the channel Las Tres Vueltas del Compás were named after the sealers’ activities. Anrique, 16,18.
Chapter 3: Hydrographical competitions. Imperial rivalries and the emergence of local knowledge about the SEP (1780s-1830s)

In September 1843, after a difficult navigation through the Western Patagonian channels, the Chilean schooner Ancud entered the Magellan Strait and landed in Port Famine. Fears that European powers could take possession of this space had prompted the Chilean government to organise an expedition to claim this territory in the name of the Republic. In the mid-nineteenth century, the Magellan coast was conceived in Chile as a remote and inhospitable space, but one crucial for the control of transoceanic navigation. For years, politicians like Bernardo O'Higgins and notable public figures such as Domingo Faustino Sarmiento had claimed the importance of the occupation of this maritime passage for the security and commercial prosperity of independent Chile. Historians have regarded the 1843 landing as the cornerstone of the expansion of the Chilean state towards the far south. However, little has been said about the capabilities of the Chilean navy and the Ancud’s crew that made the occupation of one of the most remote places on the globe possible. The expedition was led by John Williams and had the collaboration of British-born sealers who had empirical knowledge about this maritime region; Williams also drew upon hydrographic and cartographic knowledge produced by Spanish colonial expeditions of the late 1700s and the British expeditions of the 1820s and ‘30s. Focusing on this series of hydrographic expeditions to the southern passages of the Magellan Strait and Cape Horn, this chapter explores the production and circulation of hydrographic knowledge and its role in imperial competition and nation-building. I contend that these expeditions showcase the changes in the power dynamics of politics as the SEP moved from being a seascape shaped by imperial rivalries in the late 1700s to becoming a space in dispute between British imperial forces and the emerging nation-state of Chile.

The competition among European imperial powers, especially between France, Britain and Spain, focused on the control over markets, territory, and knowledge. In this context, hydrographic and cartographic knowledge was transformed into a valuable commodity for the

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462 Martínic, Historia del Estrecho de Magallanes.
control of the seas and dominion over navigational routes. As was argued in chapter 1, the production and transfer of knowledge about oceans and coastal waters was at the core of imperial competition and empire and state-formation during the Age of Revolutions. Historiographical research on hydrography has been scarce, and, until recently, it has been focused on the development of hydrographic institutions within a national framework. These national perspectives have had a limited analytical scope and have failed to integrate this field into a larger context of political, cultural, and scientific developments. Nevertheless, new work has highlighted the significance of hydrography in imperial competition during the nineteenth century. Katharine Anderson and Megan Barford’s work has stressed the importance of hydrography and the scientific navy as a distinctive feature of science and imperialism in the nineteenth century. Moreover, American historians D. Graham Burnett and Jason Smith have studied the role of hydrography in the expansion of U.S. imperialism into the Pacific and the Caribbean, and shown how hydrographical research was instrumental to the dissemination of imperial images in the U.S. Historiography on Chile, on the other hand, has highlighted the role of hydrographical research on the construction of a nationally generated body of knowledge about the Chilean coasts. Zenobio Saldivia has emphasised the role of the National Navy in the production of scientific knowledge about the SEP. In particular, Saldivia has brought to the forefront the role of National Hydrographic Office (Oficina Hidrográfica de la Marina Nacional) during the late-nineteenth century in the exploration and mapping of Chilean shores, as well as its role in the dissemination of scientific knowledge. With a descriptive focus, Rafael Sagredo has examined the hydrographic expeditions to the South Pacific in the late eighteenth and nineteenth centuries. This chapter contributes to this growing historiography on hydrography, by arguing that the production and transfer of hydrographic knowledge was instrumental for the imperial and national building processes of Spain, Britain and the newly formed Chilean Republic in the Age of Revolutions. By doing so, this chapter also sheds light on the power dynamics of knowledge production, the emerging specialisation

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466 Saldivia, *La Ciencia en el Chile*.

467 Sagredo, “De la hidrografía imperial”
of scientific practices and on change and continuity from the colonial to the national period in Spanish America.

In this vein, the quest for developing scientific knowledge about the SEP was not limited to the European metropolitan sciences. During the late colonial period, the viceroys of Lima, Buenos Aires, and the Governorates of Chiloé Island and Santiago sent several hydrographical expeditions to explore and survey Patagonian waters. These expeditions generated a corpus of locally generated knowledge that circulated in the metropolis as well as in the South American colonies. After the Wars of Independence, a significant part of this knowledge remained in the local archives of the newly formed Spanish American Republics, becoming part of the body of knowledge available to the republican governments about the national land- and seascapes. During the first years of the republican period, the newly independent Spanish American states continued developing hydrographical expeditions to generate knowledge about the sea and its coasts. In the 1830s and 1840s, the Chilean Navy organised the first hydrographical enterprises, further showcasing the relationship between political power and knowledge production.

This chapter is divided into three parts. The first section develops the discussion in chapter 1 about the importance of the construction of knowledge for imperial rivalries, focusing on the increasingly specialised and formalised field of hydrography. It analyses the British and Spanish expeditions to the southern passages in the late-eighteenth and nineteenth centuries, delving into the geopolitics of knowledge production and circulation. Section two explores the Spanish American expeditions to the Western Patagonian channels in response of the intensification of imperial rivalries. By using this case, this section focuses on the generation of Spanish American knowledge, examining how by the late 1700s, the colonies had created a corpus of locally generated knowledge about the SEP. The third section analyses the first hydrographic expeditions conducted by the Chilean Navy during the 1830s and 40s, addressing the instrumentality of these scientific endeavours to the nation-building process. By studying these cases, this section also explores the local capabilities and scientific institutions that made the development of these early explorations possible, addressing the continuities between the colonial and national period.

**Spanish and British hydrographic expeditions to the southern passages**

By the late-eighteenth century, the Pacific Ocean had been transformed into an open field for imperial expansion and competition. The exploratory voyages of the British, including Byron, Wallis and Cook’s, as well as the Frenchman Bougainville during the 1760s and 1770s, had
created new knowledge about the region, describing the different seascapes and societies that encompassed the Pacific world. They also became important tools for the European advance in the region. Furthermore, their lavish narratives had circulated widely across Europe and the Americas, exacerbating the importance of knowledge as a vehicle of imperial competition. As European interest in the Pacific grew and trade intensified, knowledge about how to navigate efficiently from the Atlantic to the Pacific Ocean became strategic. The European empires organised several hydrographic expeditions to explore, survey, and map the oceans of the globe, paying particular attention to the transoceanic passages. The search for the North-West Passage by the imperial powers—Britain, Spain, France and Russia—has attracted much scholarly attention. However, the expeditions to the southern passages, namely Cape Horn, the Magellan Strait and the Western Patagonian channels, have been marginal in historiographical research, in spite of the significant scientific attention that these passages attracted in the late-eighteenth and early-nineteenth centuries. Both the Spanish and British Empires invested important efforts in scientifically surveying and mapping this region. These exploratory expeditions aimed to provide accurate knowledge about the geography and hydrography of the region, as well as to discover the safest and most efficient way of navigating from the Atlantic to the Pacific oceans, crucial for connecting Europe with the Pacific’s markets and lands.

The development of these scientific enterprises also reveals important features of the power politics of the critical period of the 1780s-1820s for imperial rivalries. For the Spanish, knowledge about the SEP was crucial for maintaining their political and military dominance in South America and for expanding their influence across the Pacific. For the British, accurate knowledge of these connecting passages was crucial to boost their commercial and economic influence across the continent and to expand their power to the Pacific region. Moreover, the realisation of these expeditions shows the consolidation of hydrography as the main way of producing knowledge about the sea and its coast, as well as the emergence of formal knowledge networks of hydrographers whose knowledge circulated transnationally.

Córdoba and Malaspina’s expeditions: claiming control of the passages

In recent decades, historians have highlighted the efforts made by the Spanish Crown to take control over the production of knowledge about the Pacific in the late 1700s, challenging previous narratives that played down their contribution to science. The expeditions conducted by Antonio de Córdoba (1785-1789), and Alexander Malaspina (1789-1794) are part of these imperial efforts to gather crucial hydrographical knowledge about the South Sea. Until now, historians have analysed these expeditions separately; however, I contend that they should be studied together, as they were part of the Spanish Crown’s effort to scientifically assess the best route to connect the Atlantic Ocean with the Pacific Ocean. While Córdoba had the task of assessing the interior route, though the Magellan Strait, Malaspina and his crew decided to study the navigation via Cape Horn, traversing from one ocean to the other through open waters. By doing so, the Spanish expeditions managed to produce new, specialised hydrographic knowledge, that ultimately allowed them to maintain their political and symbolic dominance over the SEP until the demise of their empire in the Americas in the early-nineteenth century.

The Spanish officer Antonio de Córdoba (1740-1811) conducted two exploratory voyages to the Magellan Strait (1785-1786 and 1788-1789). On board of the frigate Santa María de la Cabeza, the first expedition set sail from Cadiz on 9 October 1785, with the aim of assessing the navigation through the oceanic passage and determining the possibility of creating a colony in the region. In spite the efforts of the crew, the hazardous environmental conditions of the region limited their scientific endeavours, making them return to Spain before completing their surveying tasks. A second expedition was then planned to complete the survey, setting sail on board of two smaller vessels, Santa Eulalia and Santa Casilda, on 5 October 1788. The crew spent almost two months surveying the Magellan coast, particularly the western entrance of the strait. Malaspina’s expedition, on the other hand, set sail from Cádiz on 30 July 1789 circumnavigating the globe on board two main vessels, La Descubierta, commanded by Malaspina (1754-1810), and La Atrevida, commanded by José de Bustamante y Guerra (1759-1825). The objectives of this voyage were twofold. First, the metropolitan administration

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470 José de Vargas Ponce, *Relación del último viaje al Estrecho de Magallanes de la Fragata del S.M. Santa María de La Cabeza en los años de 1785 y 1786. Extracto de todos los anteriores desde su descubrimiento Impresos y MSS. y Noticia de los habitantes, suelo, clima y producciones del Estrecho* (Madrid: Viuda Ibarra, Hijos y Compañía, 1788), xi.
471 Vargas Ponce, 53.
required them to produce navigational charts of the peripheral areas of the Americas and to develop routes to guide commercial navigation. Second, the crew had the mission of investigating the political and economic conditions of the American colonies. Even though the goals of this voyage were much more ambitious and global in scope than Córdoba’s enterprise, it was considered crucial by Malaspina and the Spanish authorities to continue the survey of the southern passages, as well as other key places in the transoceanic navigation corridor such as the islands of Chiloé and Juan Fernández in the SEP. Likewise, the generation of maps and nautical charts about this area in Spanish was regarded as a top priority. Thus, the focus was centred in the production of knowledge in Spanish of what was considered Spanish possessions. The idea was to create new knowledge for the benefit of the empire without the need to use information and knowledge from competing sources. This was considered instrumental for the administration of the colonies and the transoceanic navigation.

Traditional maritime historiography has regarded Córdoba’s expeditions and Malaspina’s enterprise as the most relevant Spanish scientific and hydrographic endeavours. This research has highlighted how these expeditions contributed to the general knowledge of the southern regions, particularly in the fields of geography, cartography, and ethnography. In particular, Malaspina’s expedition has been often characterised as the Spanish counterpart of the imperial exploratory voyages conducted by Cook and La Pérouse. More recently, historians of science have integrated these expeditions into a framework of regeneration of the Spanish imperial sciences. Both, Córdoba and Malaspina’s crews represent the specialisation and professionalisation of scientific practices in the production of knowledge about the sea. Their work must be framed within the rise of what Manuel Sellés has called the emergence of scientific navigation: the application of the techniques of astronomical navigation and the

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472 Letter of Alexander Malaspina to Antonio Valdés, Madrid, 10 September 1788. Sagredo and González, La Expedición de Malaspina, 162.
473 Buschmann, Slack, and Tueller, Navigating the Spanish Lake, 57.
474 Letter Ambrosio O’Higgins to José de Gálvez, Concepción, 20 July 1786. Sagredo and González, La Expedición de Malaspina, 156.
476 Juan Pimentel, La Física de la Monarquía. Ciencia y política en el pensamiento colonial de Alejandro Malaspina (Aranjuez: Doce Calles, 1998); Sagredo, “De la hidrografía imperial”.
incorporation of the latest technologies of observation and mapping to the construction of hydrographic and cartographic knowledge. After Cook and Bougainville’s exploratory enterprises, European maritime expeditions focused on the creation of rigorous scientific accounts in order to depict the geographies and seascapes that they encountered. By the 1780s, scientific practices of observation, recording longitude and latitudes, winds and temperatures, and triangulation-based mapping became the norm in the generation of hydrographic knowledge. The application of these techniques and methodologies was necessary to socially validate the generated knowledge. Furthermore, changes in naval technologies and shipbuilding made the navigation across the southern passages more feasible and safer, facilitating the exploratory tasks and making them less hazardous.

The modernisation and professionalisation of the Spanish Imperial Navy was crucial in the new way of constructing knowledge about the oceans and different geographies, as Juan Pimentel has stated. The formal training of pilots, midshipmen and other officers had been updated in Spain in the mid-1700s in order to produce knowledge according to the new standards of modern hydrography. Training in the usage of new maritime instruments such as the sextant and the octants, and the application of new techniques to determine the longitude was considered crucial. This specialised training shaped the way in which the study of the southern passages was conducted. Córdoba, Malaspina and their crew were able to survey these waters, mapping distinctive places such as the various channels and capes, keeping records of land and sea temperatures, locating the latitude and longitude of the principal islands, channels and bays, assessing the currents and winds, and fathoming the coasts. They also documented relevant knowledge about the natural history of the places that they visited and kept records

479 Edney, *Cartography. The Ideal*, 110.
480 More robust vessels made deep-sea navigation more efficient than in previous epochs. This feature was crucial for navigation around Cape Horn; however, it became problematic in more superficial waters such as in the Magellan Strait. The employment of two smaller vessels in Córdoba’s second voyage illustrates the importance of the adequate use of ships for exploratory endeavours. For more specialised accounts on shipbuilding, see John Kendrick, “The Evolution of Shipbuilding in the Eighteenth Century,” in *Enlightenment and Exploration in the North Pacific, 1741-1805*, ed. Stephen Haycox, James Barnett, and Caedmon Liburd (Seattle and London: University of Washington Press, 1997), 95–96; Larrie Ferreiro, *Ships and Science. the Birth of Naval Architecture in the Scientific Revolution, 1600-1800*. (Cambridge, Mass.: The MIT Press, 2007), 36–37.
481 Pimentel, “Ciencia y política”, 66.
482 Sellés, *Navegación astronómica*, 93.
about their contact with indigenous people. Crucially, the knowledge produced by the crew aimed to compete with the knowledge generated by the British and French expeditions.

Córdoba’s main task was to assess the Magellan Strait as a transoceanic passage for navigation. The discussion about the efficiency of navigating through the Strait over the more traditional route of Cape Horn was an ongoing debate in the second half of the eighteenth century. Bougainville, for example, had argued that despite the difficulty of the conditions, it was possible and preferable to navigate through the Strait during the summer months. The British officers Cook and Byron, on the other hand, believed it to be too risky. Córdoba and his crew determined that the Magellan Strait was not a suitable passage for connecting the Atlantic to the Pacific Oceans. The course of “the winds, the currents, the narrowness of the channels, and above all, the difficulty of anchoring in them”, were perceived as insurmountable obstacles for the navigation. Following the Spanish tradition, Córdoba argued that the route of Cape Horn was easier and less hazardous than the Magellan Strait. With this assessment, the crew dismissed the possibility of connecting the two oceans through this passage for the Spanish military and commercial navigation.

Equally as important as the adoption of the newest techniques of scientific navigation for the competition of knowledge about the southern passages, was the circulation of the results of these scientific endeavours. As Buschmann has argued, Córdoba’s expedition represented a shift in how the Spanish Empire communicated hydrographical and geographical knowledge and information. This aspect is particularly relevant in the Age of Revolutions, as the results of scientific enterprises were communicated and received social validation through printing, consolidating the social ascendance of print culture in the mid-eighteenth century. The editor of the voyage account was the Spanish official and naval historian José de Vargas Ponce (1760-1821). Vargas had experience working as a hydrographer and historian. Not only did he contribute in Vicente Tofiño’s *Hydrographic Atlas of Spain* [Atlas hidrográfico de España], but he also translated the French travel account of Jean Baptiste Tavernier, and reviewed the French Historian Abbé Raynal’s work on the Two Indies. This experience shaped his

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484 Vargas Ponce, *Relación del último viaje*, 162.
485 Vargas Ponce, 162.
486 Vargas Ponce, 46.
487 Vargas Ponce, 162–63.
488 Buschmann, *Iberian Visions*.
489 This process is not specific of the Age of Revolutions, but it got increasingly more relevant due to intensity of the imperial rivalries in the late-eighteenth century. See Parker, “Storing and Sharing Secrets,” 165–85.
490 For more information about José de Vargas Ponce’s role in Córdoba’s voyage account see Buschmann, *Iberian Visions*, 195-202.
engagement in the edition of Córdoba’s enterprise, pushing publication and recognition of Spanish Naval enterprises in the navigation and hydrographic study of the Magellan Strait. Vargas had the idea of publishing the results of the hydrographic expedition, linking them with the history of past explorations to the strait. Since the mid-eighteenth century, “Spanish writers had taken timid steps publishing earlier navigators’ journals”. Vargas took this idea to another level, assembling in one volume all the previous experiences of the navigation through the Magellan Strait. By doing so, the editor connected the Spanish sixteenth and seventeenth centuries voyages with the British and French maritime enterprises of the 1700s, and presented Córdoba’s expedition as part of a long tradition of Spanish naval exploration. Vargas also recognised the importance of making past voyage accounts public. In his introduction, he argued that the silence and secrecy of the past had particularly hindered the Spanish Crown and the navigation of the seas more broadly. His aim was to equate Spanish maritime endeavours with the enterprises of the other European powers, emphasising the contributions of previous Spanish exploration.

The published account was also used to reclaim the geographies of the Magellan Strait. Vargas included in the publication a list of different names of places in the Magellan region, systematically organising the information and knowledge available. In the context of imperial rivalries, the names of the different places became a controversial issue, as Buschmann’s analysis of the Pacific has demonstrated. This list, then, served as response to the increasing importance and popularity of English and French names, reinforcing the prevalence of Spanish names and symbolic Hispanic dominion over this area. Vargas’ narrative also presented Córdoba’s voyage as the culmination of European exploratory endeavours in one of the most difficult and dangerous environments in the world. He and his crew were positioned as almost heroic figures that systematically conducted surveys and mapped the region to generate new and accurate knowledge. The use of the precise language of hydrography was crucial to adding legitimacy to Córdoba’s enterprise. Both the accounts of his first and second expeditions carefully described the seascape in terms of latitudes and longitudes, fathoms, and direction of winds, integrating also a series of tables that summarised the nautical observations, as well as a thorough description and explanation of the route.

492 Vargas Ponce, *Relación Del Último Viaje Al Estrecho*, ix.
493 Vargas Ponce, xv–xvi.
Vargas compiled this information in a way in which Córdoba’s finding were presented as the synthesis of knowledge and the most accurate depiction of the Magellan seascape.

Córdoba’s assessment of the region and his cartographic knowledge, however, was eclipsed by the expedition commanded by Alexander Malaspina to South America and the Pacific. In the southern passages that connected the Atlantic with the Pacific oceans, Malaspina’s crew managed to survey and map Patagonian and Tierra del Fuegian shores in exacting detail. On the Atlantic coast, Malaspina’s crew charted several ports and bays, including Santa Elena, Port Desire, and San Julián, among others, and surveyed Port Egmont in the Falklands Islands. Malaspina also employed the Spanish American pilot Juan de la Peña to further survey this area and chart as far south as Staten Island. Additionally, the crew surveyed Tierra del Fuego since Malaspina regarded it as important to determine a secure docking place for Spanish navigation. The weather conditions, however, dramatically hindered the exploratory tasks of the crew. Faced with adverse conditions and limited supplies, Malaspina decided not to survey the interior passage of the Magellan Strait since it had already been studied by Cook and Córdoba, who had assessed it as a hazardous sea-passage, dangerous for navigation. Instead, he thought it more useful to fully examine the most common route of the transoceanic navigation, Cape Horn, and to survey key places in their navigation towards Chiloé Island.

In their survey of Cape Horn, Malaspina’s crew needed to determine the best way to navigate it. There were two main routes, either hugging the coast of Tierra del Fuego, or rounding Cape Horn by navigating in open waters. To do so, the crew thoroughly surveyed the region and used historical records of previous European expeditions. In particular, Malaspina read and compared the accounts of Sarmiento de Gamboa (1579-1580;1584-1587), Frezier (1712-1714),

495 Córdoba’ second voyage narrative was also edited by Vargas. This was a short volume that presented the route followed by the Spanish expedition as well as its main results. It was written with a more practical approach, detailing the calculations and corrections of the astronomical observations made by the officers Cevallos and Churruca, as it also explained the processes and techniques used to calculate longitudes and latitudes, at where best harbour at. See, José de Vargas Ponce, Apéndice a La relacion del viaje al Estrecho de Magallanes de la fragata de guerra santa maríã de la cabeza, que contiene el de los paquebotes Santa Casilda y Santa Eulalia para completar el reconocimiento del estrecho en los años de 1788 y 1789 (Madrid: Imprenta de la Viuda de D. Joaquín Ibarra, 1793), 10,51,52,103.
499 Sagredo and González, 194, 343.
500 Sagredo and González, 194.
and Cook (1768-1771; 1772-1775).\textsuperscript{501} Taking into consideration his surveys and pondering Cook’s ideas, he concluded that the best and more efficient way was to take the open waters to traverse towards the Pacific region.\textsuperscript{502} With these results, Malaspina backed up Córdoba’s assessment of Cape Horn as the best route and supported Cook’s analysis with regards to the navigation through open waters. By doing so, Malaspina was able to discourage the use of other maritime passages and champion an established route to navigate from the Atlantic Ocean to the Pacific Ocean more safely.

To complete the task, the Spanish crew also surveyed other important places in the transoceanic navigation, extending their analysis to key places in Western Patagonia. Locations such as the entrance of the Magellan Strait and Madre de Dios Island had been in the past the object of contested knowledge originating from competing European accounts; therefore, the production of accurate knowledge was deemed crucial.\textsuperscript{503} Furthermore, they studied the viability of a Spanish settlement in the area to dissuade foreign powers to take it over. In his assessment, Malaspina generated a negative image of this marine environment. In his view, East Patagonia was a barren land that lacked suitable ports for transoceanic navigation, considering the Spanish outpost in the area a waste of fiscal resources.\textsuperscript{504} For Malaspina, the only activity fruitful in such lands was fishing. In tandem with contemporaneous ideas of the commodification of oceans, Malaspina argued that cod fisheries could stimulate national industry, and importantly, it could discourage the presence of foreign fisheries.\textsuperscript{505} The Western side, on the other hand, was thought of as a remote and inaccessible maritime space, and therefore useless for the Spanish Crown.\textsuperscript{506} Additionally, the crew also dismissed the fears of a foreign occupation stated by many Spanish officers, arguing that the hostility of the environment would make any settlement almost impossible to maintain.\textsuperscript{507} This negative image of Patagonia had important and enduring repercussions for this region as it discouraged further Spanish engagement and colonisation projects in the region.

The generation of new nautical charts was also considered crucial to restore the imbalance of knowledge production about the southern passages. Both expeditions produced several

\textsuperscript{501} Sagredo and González, 190,200.
\textsuperscript{502} Sagredo and González, 193.
\textsuperscript{503} See Urbina, “La isla Madre de Dios”.
\textsuperscript{504} Sagredo and González, \textit{La expedición de Malaspina}, 304.
\textsuperscript{505} Sagredo and González, 307–13.
\textsuperscript{506} Sagredo and González, 314.
\textsuperscript{507} As has been analysed in previous chapters, the Spanish were concerned about foreign presence in the southern tip of the continent. The publication of Byron and Cook’s accounts, as well as the news about sealers and whalers hunting activities, emphasised those fears.
hydrographic charts and plans of particular bays and natural ports, designed to create a full depiction of the region. For example, Josef Díaz’s manuscript chart of the strait (Fig.3.1) integrated the main results of Córdoba’s two expeditions. This chart depicts the latest surveys to Cape Monday and Cape Victoria, as well as integrates rectifications of previous cartographies that modified the latitude and longitude of several places surveyed in the first voyage. The aim of this chart is to depict the most important hydrographic features of the strait, presenting the depths of each bay. Moreover, it integrated the drawing of several coastal profiles of the main landscapes, which were added to further guide the navigator across this intricate seascape. Interestingly, Díaz’s map also featured a navigational route to successfully steer through Cape Horn, even though Córdoba and his crew concluded that its navigation was not recommended. Overall, the main goal of this chart was to incorporate and summarise the available information about the southern passages, to showcase the progress of Spanish hydrography in the construction of knowledge of this region, and to reclaim this space as a Spanish dominion, as the majority of the localities were represented with their Spanish names. Simplified versions of Córdoba’s cartographies were printed and published in Spain. As Rodrigo Moreno has recently identified, these charts omitted relevant hydrographic data, such as the depths of the bays. This is interesting because it shows that the publication of hydrographic charts did not mean the dissemination of all the information available; secrets and omissions of geostrategic information were maintained. Furthermore, this case also highlights that the published charts were less useful for navigation, and more instrumental as political tools of imperial propaganda. In particular, the publication of the Magellan Strait’s chart with Spanish names marked this space as Spanish, symbolically integrating it to the Iberian transoceanic empire.

508 Moreno, “Magallanes entre los siglos,” 121.
Fig. 3.1. Josef Díaz, *Reduced chart of the Magellan Strait from Cape Blanco to Cape Vírgenes* (1789). Courtesy of Museo Naval de Madrid. MN- 53-C-11 2301936.
A closer analysis of these expeditions’ charts also helps historians to understand how hydrographic and cartographic knowledge was produced and transferred in the Age of Revolutions. For example, the chart of the Magellan Strait (Fig. 3.2) shows the new hydrographic knowledge produced by Córdoba’s first voyage, as well as geographical information and knowledge from other European expeditions. As the harsh environmental conditions did not allow Córdoba to complete the survey of the region, leaving places unexplored, the Spanish mapmakers decided to incorporate information from previous Spanish and British exploratory enterprises. As the inscription of this map explains, the eastern side of Tierra del Fuego was drawn of the information transferred from Byron, Cook, and the Nodal Brothers. Western Patagonia and Tierra del Fuego was completed by adapting the cartographic data of Cook and Sarmiento de Gamboa. The transfer of hydrographic and cartographic information and knowledge was a common practice among mapmakers in the early modern period. This has been described by Katherine Parker as “competitive collaboration”, the process by which European mapmakers incorporated geographic knowledge from other (competing) cartographies and geographical accounts. The main idea was to integrate the most accurate knowledge available, while showcasing the scientific advances produced nationally, in this case by the Spanish expeditions. This strategy was not only deployed by mapmakers. The editor of Córdoba’s narrative incorporated knowledge from different sources, namely the accounts of Bougainville, Jorge Juan and Antonio Ulloa, and the British voyages edited by Hawkesworth, in order to illustrate the geography of Western Patagonia, where Córdoba had not managed to survey. Likewise, Malaspina used both Córdoba and Cook’s data to depict the entrance of the Magellan Strait, an area that he could not fully survey due to adverse environmental conditions. Furthermore, Malaspina constantly cited information from competing hydrographic expeditions, such as the explorations of Frezier, Anson, and Cook, comparing and critiquing the accuracy of their knowledge. In practical terms, these discussions and circulation of knowledge contributed to making the transoceanic navigation more efficient; however, in symbolic and political terms, they were made to highlight the superiority of the imperial sciences.

The Spanish enterprises not only used information and knowledge from competing European powers, they also used knowledge produced by local Spanish American expeditions. For

510 Sagredo and González, La expedición de Malaspina, 200.
511 Sagredo and González, 190.
example, to create an accurate depiction of the Western Patagonian channels, a region he did not survey, Malaspina used knowledge generated by the local expeditions led by the pilots Machado and Moraleda.\textsuperscript{512} As he noted in a 1790 letter to the Minister Antonio Valdés, Malaspina read and studied reports, maps and charts produced by the Spanish American expeditions.\textsuperscript{513} Moreover, not only he met with José de Moraleda in Chile, but asked him to work developing charts of the local geographies.\textsuperscript{514} As was aforementioned, in his visit to Buenos Aires, Malaspina also hired the services of Juan de la Peña, to explore, survey, and chart the coastline of East Patagonia.\textsuperscript{515} Thus, even though these enterprises had a marked national/imperial tone, a closer analysis of the knowledge production shows how these expeditions relayed on both the circulation of competing European hydrographic surveys as well as local colonial accounts, developing formal networks of hydrographic knowledge.

Fig. 3.2. Chart of the Magellan Strait and part of Tierra del Fuego’s coast (1786). Courtesy of Library of Congress Geography and Map Division Washington, D.C. 20540-4650 USA dcu

\textsuperscript{512} Sagredo and González, 204.
\textsuperscript{513} Sagredo and González, 301.
\textsuperscript{514} Sagredo and González, 301.
\textsuperscript{515} For expanded analysis of Juan de la Peña’s expedition, see: Figueroa, “Inspección Territorial”
Maps were also crucial tools for making public the knowledge developed by the Spanish expeditions. The case of Malaspina expedition’s cartographies exemplifies this. As it well known, Malaspina’s records remained hidden for years as he was taken prisoner when he returned to Spain. Even though his reports and analysis remained unpublished, the maps produced by the expedition’s crew circulated widely.\footnote{It is well known that Alexander Malaspina could not publish his reports and findings due to political conflicts with Spanish imperial officers. See, Pimentel, La Física de la Monarquía.} They became the main way in which Malaspina’s analysis about the southern passages and other geographies of the Americas and the Pacific region were available to the public. Indeed, Malaspina’s cartographic endeavours were quickly integrated into the geographical body of knowledge of the Spanish Empire. In 1798, the Spanish Minister of the Marine, Juan de Lángara (1736-1806), published *Chart of the coasts of South America* (Fig. 3.3), which depicted the results of Malaspina’s expedition to South America. The map portrayed the route followed by Malaspina’s vessels, *La Descubierta* and *La Atrevida*, and the results of the hydrographic survey, particularly highlighting the depths, in fathoms, off the coasts and the sites where the astronomical and geometrical observations were taken. The map also included drawings of cross-sections of the mountains of Cape Horn, Port Desire, and the islands of Mocha, Madre de Dios, and Diego Ramírez, in order to present the most important geographical features of Patagonia and Tierra del Fuego, and their exact location. With the publication of this map, the Spanish officers aimed to equate Spain’s latest hydrographic enterprises of the region to the British and French enterprises of the late-1700s, and to bring back the Spanish names of these geographies. Notably, Lángara’s map also integrated Malaspina’s results with the surveys completed by Córdoba in the Magellan Strait and the results of the Spanish American expedition to Western Patagonia commanded by Francisco de Clemente y Miró (1792-1793). Hence, the publication of this chart made public the latest hydrographical surveys on South American waters. By doing so, the Spanish were able to integrate all the information and knowledge available about the Patagonian coasts and the southern passages, symbolically integrating them in their political sphere of influence, and, thus, reasserting their dominance in the region.

Nonetheless, the circulation of the results of the Spanish expeditions to the southern passages was limited in comparison with the British counterparts. For example, Córdoba’s voyage account was translated into English only by the 1820s.\footnote{José Vargas Ponce, *Voyage of Discovery to the Strait of Magellan: With an Account of the Manners and Customs of the Inhabitants, and of the Natural Productions of Patagonia undertaken, by Order of the King of Spain* (London: Phillips, 1820).} This was an abbreviated version that
contained the occurrences of the voyage and the description of the Magellan geography, flora and fauna, and the contact with the indigenous communities. The charts of Córdoba’s expeditions also had limited circulation. As British Captain Phillip Parker stated in the early 1830s, the acquisition of these charts was very hard.\textsuperscript{518} In addition, the circulation of Malaspina’s expedition results can be characterised as a failed project. As was noted previously, Malaspina’s voyage account was not published at the time. In spite of this, some textual and cartographic material produced by members of the expedition managed to get published. For example, the surveying work of José de Espinosa y Tello in the coast of North America and the research of the Medical doctor of the expedition, Pedro María González, were published in 1802 and 1805, respectively.\textsuperscript{519} Moreover, the cartographic production of the expedition circulated widely amongst European hydrographic community, as the British hydrographers accounts of Parker King and Fitz Roy show.

\textsuperscript{518} Phillip Parker King, “Some Observations upon the Geography of the Southern Extremity of South America, Tierra Del Fuego, and the Strait of Magalhaens,” The Journal of the Royal Geographical Society of London 1 (1831): 156.

\textsuperscript{519} Dionisio de Alcalá (ed.), Relacion del viage hecho por las goletas Sutil y Mexicana en el año 1792 para reconocer el estrecho de Fuca: con una introducción en que se da noticia de las expediciones ejecutadas anteriormente por los españoles en busca del paso del Noroeste de la América (Madrid: Imprenta Real, 1802); Pedro María González, El tratado de las enfermedades de la gente de mar, en que se exponen las causas y los remedios de precaverlas (Madrid: Imprenta Real, 1805).
Fig. 3.3. Juan de Lángara, Chart of the coasts of South America (1798). Courtesy of Stanford University
The SEP was not a priority for the British Admiralty after Cook’s exploratory voyages. Instead, the Admiralty focused their hydrographical studies on other regions of the Pacific Ocean, namely the Pacific islands, and the search for the North-West Passage. In the early 1790s, the military conflicts over Nootka Sound accentuated the political and colonial potential of the North Eastern Pacific to the detriment of other spaces in the Pacific Rim. Furthermore, the involvement of Britain in the Napoleonic Wars and the regional conflict of the Spanish American Independence Wars put on hold the development of further British scientific expeditions to the SEP during the first decades of the nineteenth century. However, the dissolution of the Spanish Empire in the 1820s left open this region to a new imperial power.

British presence in the SEP had become increasingly strong by the turn of the nineteenth century as the hunting activities of sealers and whalers intensified, and as commercial barriers between Britain and the Spanish American territories diminished with the demise of the Spanish colonial dominion. In this new political scenario, British authorities argued that the geographic and cartographic knowledge of the region had become “inadequate to the wants of the rapidly growing [maritime] intercourse”. An accurate knowledge about the SEP became regarded as strategic for British interests. Shipwrecks in particular were a constant menace to Britain’s commercial and political dominion. The Admiralty commanded the organisation of two consecutive hydrographic enterprises to survey and chart the southern extremity of South America, with especial focus on the southern passages that connected the navigation between the Atlantic Ocean and the Pacific Ocean. Captain Philip Parker King (1791-1856) commanded the first scientific expedition between 1826-1830, successfully surveying the southern passages of the Magellan Strait, Cape Horn, and discovering a new passage named Beagle Channel. The second voyage (1831-1836) was commanded by Robert Fitz Roy (1805-1865), who was instructed to further survey the maritime passages, expanding their activities also to other regions of the Pacific. This expedition acquired great fame as it also carried the naturalist Charles Darwin.

The historiography on these expeditions has tended to focus on the significance of the voyage to Darwin’s scientific work, distorting their relevance to the history of maritime sciences, as

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George Basalla argued in the 1960s. These expeditions to the southern passages exemplify and showcase the importance acquired by hydrography as an instrument of imperial expansion and its colonial projects over the globe. The military and commercial expansion of the British empire required a precise and scientific knowledge of the seas; it was the task of the British Admiralty to provide correct nautical charts, sailing directions, and records of soundings and tides tables to enable British navigation. Parker King and Fitz Roy’s expeditions also embodied the changes within the British Navy with regards to the specialisation and professionalisation of hydrography as a knowledge field. In 1795, the Admiralty had founded the Hydrographic Office “originally as a department to organise and publish” relevant hydrographic information from existing charts and surveys. However, as Britain emerged as a global power after the Napoleonic Wars, the Hydrographic Office increased their functions, acquiring the faculty to organise hydrographic enterprises. By the mid-1820s, the Office organised surveyor enterprises to research and study maritime regions of particular commercial, strategic or colonial interest. While the Parker King, Fitz Roy and their crew were surveying the South American coasts, nine other hydrographic enterprises were deployed in different maritime regions, expanding Britain’s knowledge about the globe’s oceans.

The first expedition to the southern passages set sail from Plymouth on 22 May 1826 with the vessels the H.M.S. Adventure, commanded by Parker King, and the H.M.S Beagle, captained by Pringle Stokes (1793-1828). Absence of accurate hydrographical knowledge was regarded as the main motivation of this surveyor enterprise. In his report to the Royal Geographical Society of London in 1831, Parker King highlighted the lack of scientific knowledge, pointing out how little-known were the shores of Tierra del Fuego, the Strait of Le Maire, and the western end of the Magellan Strait. Moreover, he claimed that Western Patagonia, from Cape Victoria to Chiloé Island, could be considered wholly unknown. The framework of scientific navigation provided the social validation for the development of this hydrographic enterprise. According to Parker King, “modern surveys are made so much more in detail than was formerly

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523 Barford, “Fugitive Hydrography,” 211.

524 Barford, 211.

practised or considered necessary, that little can be derived from the charts and plans that have hitherto been formed”. He studied the accounts of previous expeditions, but he judged them to be highly inaccurate. Indeed, in the forty years that separate the Spanish and British expeditions of Parker King, the technology and mapping techniques had changed significantly, particularly in regards to the application of surveying techniques and coastal-triangulations.

For Parker King, not even the more recent maps drawn by the sealer James Weddell in the 1820s met the standards of precision and accuracy developed by British Naval officials and hydrographers. Parker King’s surveying and mapping endeavours exemplifies the consolidation of hydrographic practices as the main way of describing and producing knowledge about the sea and its shores, and the institutionalisation and professionalisation of this knowledge through the work of the Hydrographic Office.

Equipped with the most modern chronometers and nautical instruments of the time, the expedition of the Adventure and the Beagle produced a detailed hydrographical account of the transoceanic navigation. The crew surveyed, sounded and mapped the southern coast of the American continent, from Chiloé Island on the Western side to Port Desire in Eastern Patagonia. Changes introduced to ship-design after the Napoleonic Wars also enabled the exploratory endeavours. The Beagle, for example, underwent relevant transformations to make it more manoeuvrable in shallow coastal waters, such as in the Magellan Strait. Parker King focused his analysis on describing how to navigate from one ocean to the other in order to make the maritime connections safer and more efficient, a subject to which he devoted an entire chapter of his published account. In line with eighteenth-century explorers, Parker King engaged in the ongoing discussion of which navigational route was better: the Magellan Strait or Cape Horn. In contrast to what the Spanish had concluded forty years before, Parker King remarked that the best and less hazardous way of traversing these seas was navigating through the Magellan channels. As the British captain explained, the navigation of the strait had “been

526 Parker King, 157.
527 For example, the exploration of the Magellan Strait was guided by the accounts of Sarmiento de Gamboa, Bougainville, Cook and Córdoba. See, chapters III and V. Phillip Parker King, Narrative of the Surveying Voyage of His Majesty Ships Adventure and Beagle, Between the Years 1826 and 1836, Describing the Examination of the Southern Shores of South America, and the Beagle’s Circumnavigation of the Globe, vol. I (London: Henry Colburn, 1839).
529 Parker King, “Some Observations,” 156.
531 Parker King, Narrative of the Surveying Voyage, I, 463–75.
rendered much easier since a correct delineation of its shores, and plans of the anchorages, ha[d] been made”532. The navigation via Cape Horn, on the other hand, was remarked upon as dangerous, as the vessels were exposed to adverse winds, severe gales and rough seas.533 With this assessment, the British captain opened up this passage to a new era of transoceanic navigation.

Furthermore, the expedition revealed hitherto unknown channels and fjords to European knowledge. This is the case of Skyring Water, a narrow channel located to the north of the Magellan Strait. The small party commanded by Lieutenant Skyring found the mouth of this channel, which carried them for twelve miles into uncharted waters. This discovery opened new alternatives ways to navigate the interior Patagonian channels. Indeed, the initial surveys led the crew to believe that this body of water was a channel that communicated the Magellan Strait with the western side of the continent.534 In spite of the efforts made by Skyring’s team to explore this area, the party could not go any further because of the strong gales and the lack of sufficient provisions to maintain the crew. Hence, no clear conclusion about the geographical features could be reached, leaving further queries for future expeditions. A similar situation was experienced with the discovery of the eastern mouth of a channel in Tierra del Fuego by Matthew Murray. According to the officer, this entrance could guide the navigation westward to the Pacific; however, the party did not have the time to confirm this assumption.535 Murray’s navigation was the first voyage made by European vessels of a third transoceanic passage: The Beagle Channel.

After four years of surveying the southern seas, Parker King’s enterprise was finalised in October 1830 when the vessels finally arrived in Plymouth. As the map of the region published in the Journal of the Geographical Society of London in 1831 and Parker King’s accounts show, the Patagonian and Fuegian channels were surveyed and charted more thoroughly than ever before. However, due to the intricate geography of this environment, there were some channels, sounds and fjords that remained insufficiently explored. A close up of the chart of South America (Fig. 3.4) reveals the lack of precision of the borders of some of the islands, fjords and channels, such as Skyring Water. According to Martinic and Porter, the lack of

532 Parker King, I,467.
533 Parker King, I,167.
534 Parker King, “Some Observations”, 162.
accuracy of the delineation of these places motivated the second exploratory voyage.\textsuperscript{536} The realisation of this second expedition showcases the confidence in hydrographic techniques as the main way to create knowledge and produce new cartographies about this seascape; more importantly, it reflects the importance of the southern passages as a relevant connecting route. By the early 1830s, the British engagement with the Spanish American region had increased, particularly with Chile; therefore, accurate knowledge of the region, especially how to navigate, was considered of the outmost importance for securing further commercial and political ties. Spaces left unexplored were potentially hazardous for British interest in the Spanish American Pacific. Yet, the motivations of this second expedition cannot solely be defined by the necessity of accurate new knowledge. As Schell has remarked, the \textit{Beagle} expedition was a part imperial and part personal mission. Fitz Roy wanted to return home three Patagonians, two men and one woman,\textsuperscript{537} named York Minster, Jemmy Button, and Fuegia Basket, who had been kidnapped in the first expedition in the year 1830, along with a fourth-person named Boat Memory. This man had died of smallpox shortly after his arrival to England. As Schell has argued, after removing them from their home, Fitz Roy had taken as his personal mission to carry them to England to educate them, and then return them to their own communities, acting as ambassadors of Western civilisation.\textsuperscript{538} These personal motivations need to be taken into consideration as equally important as the geopolitical reasons behind the second expedition to the southern passages, although this chapter will focus primarily in the imperial and political drives.

\textsuperscript{537} Schell, \textit{The Sociable Sciences}, 40.
\textsuperscript{538} For more details about this affair, see Schell, \textit{The Sociable Sciences}, Chapter 1.
The second expedition commanded by Robert Fitz Roy completed the surveying and mapping of the Patagonian and Fuegian channels. The crew set sail for South America in December 1831, with orders to thoroughly survey the extremity of the continent with particular emphasis on Eastern Patagonia (from the inlet of Bahía Blancas to the entrance of the Magellan Strait), the Falkland Islands, Tierra del Fuego, and the channels of Western Patagonia, particularly the less explored area between the Adelaide Archipelago and Campana Island. The Admiralty also required them to accurately map the situation of Otway and Skyring Waters, in order to examine all the channels that may connect and therefore facilitate navigation to the Western side. Moreover, the British Admiralty’s Hydrographer of the Navy, Francis Beaufort (1774-1857), strongly advocated expanding the surveying to South America. Specifically, the Admiralty wanted to accurately survey and map the location of key places in the SEP, namely Mocha Island, and the ports of Valdivia, Concepción, and Valparaíso. According to Fitz Roy’s published account, these places were imperfectly known as the only charts available were older Spanish maps, which only laid down the location of some ports. They were also instructed to survey the Desventuradas and Galápagos Islands and the port of Guayaquil, and then

539 Parker King, *Narrative of the Surveying Voyage*.
541 Fitz-Roy, II:30.
542 Fitz-Roy, II:32.
navigate westwards to the Pacific Islands. The expansion of the survey tasks to the South American rim and its adjacent islands further demonstrates the increasing importance of South America to the British imperial interests.

The crew spent forty-two months surveying the South American coastline. As instructed, the expedition focused their efforts on the survey of the southernmost part of the continent. The crew surveyed and mapped the coastlines of Eastern Patagonia, the Falkland Islands, Cape Horn, the Magellan Strait, and the Chonos and Chiloé Islands in Western Patagonia. In his published account, Fitz Roy presented his analysis on the southern passages, emphasising the progress made in the survey of this maritime space. The completion of the survey tasks led them to confirm the conclusions reached in the first expedition. The Magellan Strait remained as the most secure and efficient way to navigate from the Atlantic Ocean to the Pacific Ocean. Moreover, Fitz Roy argued that steam navigation may prove useful for the navigation of the intricate Western Patagonian channels, particularly between Chiloé Island and the Magellan Strait. This finding had the potential to change the navigation from the Atlantic to the Pacific Ocean, making it more secure through the interior channels of Western Patagonia.

The chart of the Magellan Strait (Fig. 3.5) shows the contribution of Fitz Roy’s expedition to the hydrographic depiction of the transoceanic passages. It shows the results of the hydrographic surveys, highlighting the depths of several bays and places along the navigation of the Magellan Strait, especially at the eastern entrance of this passage. This map also included the analysis of previously insufficiently known areas, such as the Beagle Channel, which was confirmed as a separate passage that connected the Atlantic with the Pacific Ocean, and Skyring Water, which after being surveyed, was found to be a fjord. Additionally, it included the results of geographical surveys conducted in the region, depicting the altitudes of the main mounts, such as Mount Sarmiento. Notably, this cartography reflects a symbolic appropriation of the Magellan geography, as the Spanish names in several places were erased, or anglicised, such as Charles III Island (Isla Carlos III), or put together (Land of Desolation of Narborough or the Sta. Inés Islands). The results of this mapping enterprise circulated widely as Fitz Roy delivered several charts to the Chilean government and they were included in the published accounts of the voyages. Moreover, the recognised mapmaker John Arrowsmith (1790–1873) included

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them in his 1838 map of South America, making their depiction of the Patagonian seascape widely available for the educated European circles.547

Parker King and Fitz Roy’s surveying endeavours exemplify the specialisation and professionalisation of hydrography developed in the context of European imperial rivalries during the Age of Revolutions. The use of the latest technology, but particularly the application of triangulation techniques to map the coastal lands resulted in the creation of the most accurate depiction of the southern geographies of the day, embodying what Edney has called the ‘ideal

548 Parker King, Narrative of the Surveying Voyage.
of cartography’, that is, the production of images that resemble and mimic the reality. Fitz Roy’s work in particular epitomises the specialisation of this field. His voyage account appendix systematically described and recorded meteorological information, the wind speed, and the location of the places encountered along the coastline with their respective latitudes and longitudes. Furthermore, this account featured thoughts and theories regarding the oceanic environments. Specifically, the British officer was concerned about the effect of winds on the weather, the behaviour of tides and, importantly, the connection between currents and ocean streams to climate conditions. Fitz Roy’s observations paved the way to further changes in the maritime sciences, especially as emerged a new science interested in oceanic phenomena: oceanography.

Parker King and Fitz Roy’s voyage accounts circulated widely. The volumes were translated into several European languages, and reprinted multiple times in different continents, showing the global reach of this work, as Anderson has recently remarked. Furthermore, the reception of the published account by the scientific community and the literate public was very positive. The President of the Royal Society of London, William Hamilton, praised the knowledge produced by the expeditions, equating Fitz Roy’s achievements to those of Alexander Von Humboldt in the knowledge production of South America. The journal The Edinburgh Review emphasised the importance of the account for the knowledge of the southern seas and as an example of Britain’s contemporary naval superiority. The article summarised the main geographic and cartographic findings of expeditions, liking these voyages to a history of European explorations in the southern oceans. The circulation of journals such as The Edinburgh Review helped to disseminate and popularise Parker King and Fitz Roy’s explorations in the SEP. A copy of this article, for example, was translated and published in the Chilean periodical El Araucano, showcasing the global reach of their research.

549 Edney, Cartography. The Ideal, 1.
551 Fitz-Roy, Narrative of the Surveying Voyages II:505.
552 Anderson, “Reading and Writing.”
554 “Narrative of the Voyages of H. M. S. Adventure and Beagle; Detailing the Various Incidents Which Occurred during their examination of the Southern Shores of South America, and during the Beagle’s Circumnavigation of the Globe. By Captain King and Fitzroy, R. N., and Charles Darwin, Esq., Naturalist of the Beagle,” The Edinburgh Review; Edinburgh, Etc. 69, no. 140 (1839): 467.
555 El Araucano, 7-14-21-28 February 1840.
The knowledge produced by the expeditions commanded by Parker King and Fitz Roy was instrumental in developing the British Empire’s political and commercial interests in South America. As Ritchie has argued, “Fitzroy’s charts opened up the South American continent to European trade”. This featured a new era for the commercial exchanges between the United Kingdom and the newly independent Republics of the continent, and the Pacific and Atlantic connection more broadly. The results of the expeditions opened up the possibility of colonising what hitherto had been understood as inhospitable nature. Even though the voyage’s accounts, particularly Darwin’s, rendered the Patagonian environment as a wasteland, their analysis regarding the navigation of the Magellan Strait emphasised its strategic role as a connecting passage and reinforced past assertions of its geopolitical importance. It is no coincidence that in less than a decade, the British trade firm, the Pacific Steam Navigation Company, used the route of the Magellan Strait to traverse from the Atlantic to the Pacific. Furthermore, the exploratory enterprises of Parker King and Fitz Roy contributed to the generation of a British global gathering of hydrographic knowledge. These enterprises were part of wider efforts of the British Admiralty, the imperial government and other social organisations, such as the Royal Geographical Society of London, to produce new knowledge of the diverse geographies of the globe. This knowledge shaped new geographical imaginations of the new order after the Napoleonic Wars, stressing the political and symbolic dominance of the British empire as a global power.

Spanish-American expeditions to Western Patagonia

Historians have often marginalised the Spanish American expeditions when it comes to the study of Spanish engagement with the Pacific region. Nevertheless, in the early modern period, most of the exploratory voyages to the southern regions were confined to the authorities of Santiago and Chiloé Island, who were instructed to survey the Western Patagonian channels and the maritime passage of the Magellan Strait, and to those of Buenos Aires and Montevideo, who were responsible of the exploration of East Patagonia. Following the work of historians such as Buschmann and Maroto, this section focuses on the Spanish American expeditions and their role as knowledge producers, in order to stress their contribution to an imperial geographic

558 See Hanisch, *La Isla de Chiloé*. 
knowledge system. It examines the expeditions organised by the colonial authorities based in Lima, Santiago and Chiloé Island to explore and map the connecting maritime passages of Western Patagonia. By doing so, it explores the emergence of a locally generated knowledge about South American geography by the late colonial period.

By the mid-1700s, Chiloé colonial authorities had organised several expeditions to explore the Western Patagonian channels. These expeditions had gathered knowledge about the seascape, its coast, and the indigenous communities that inhabited the region. However, this knowledge was not developed with the application of the latest technology and techniques of scientific navigation, becoming obsolete with regards to the standards of modern hydrography. As British presence in the Pacific region increased, colonial authorities commanded the officers Nicolás Lobato, with his pilot Francisco Clemente y Miró, and José de Moraleda to conduct a thorough examination of Western Patagonia. The Lobato-Clemente expedition and Moraleda’s three exploratory voyages surveyed and mapped this seascape, creating new hydrographic knowledge of the region. By doing so, these explorers were able to assess this maritime environment, informing the best routes to traverse the region, and incorporated it into the Spanish imperial geographical imagination, as they mapped and named islands, ports and rivers.

Historians have granted an important place to the pilot José de Moraleda and his contribution to the knowledge of the American seascape. More recently, Rafael Sagredo has emphasised the legacy of Moraleda’s work in the hydrography of the Patagonian region and has showcased the way in which Moraleda’s hydrographical research represented the application of the procedures of the modern Spanish pilotage system to the study of South America’s coastal waters. Similar views have been shown by Macarena Ríos, who has highlighted the importance of scientific rigour in Moraleda’s hydrographic methodology which, combined with his interest in historical accounts (maps and voyages’ accounts), resulted in the creation of a standardised knowledge about the Central American seascape. For historians of Latin America, Moraleda represents an outstanding scientific figure, who contributed to creating

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560 For example, Hanish called him the greatest expert of Chiloé’s geography and Barros Arana regarded him as “the most expert explorers of the day” José de Moraleda, *Exploraciones Geográficas e Hidrográficas de José de Moraleda i Montero* (Santiago de Chile: Imprenta Nacional, 1888), v; Hanisch, *La Isla de Chiloé*, 89; Sagredo, “El Piloto Moraleda”, 403; Sagredo, “De la hidrografía imperial,” 518.
more accurate knowledge about the Eastern Pacific; however, I argue, Moraleda does not stand alone. He was part of a political context where Spanish American authorities promoted hydrographical expeditions in order to create knowledge about the American seascape and safer routes for commercial navigation.

This is the case of the expedition to Western Patagonia commanded by Nicolás Lobato in 1792. Following the Royal Decree of December 1790 that commanded the local authorities in Spanish America to explore the inhabited coasts of America, Ambrosio O’Higgins, as governor of Chile, instructed Lobato to survey the forlorn Patagonian coast. Aware of the conflict between Spain and Great Britain over Nootka Sound, O’Higgins recognised the importance of this southern region for the imperial projection of the Spanish empire over the entire Pacific Ocean.563 His plan was to produce new, accurate knowledge of the Patagonian channels, from Chiloé Island to the mouth of the Magellanic Strait. He sought further hydrographic information of soundings, ports, islands, as well as reports on the geography and the people that inhabited the region.564 He was concerned about the creation of a Spanish settlement in Western Patagonia and the possibility of British presence in these lands. He commanded Lobato to outline a precise account of the navigational route, as well as create hydrographic records and geographic descriptions of the area, with maps and charts to accompany this information.565 In order to do so, O’Higgins ordered him to gather all the knowledge from previous exploratory voyages and to study the existing maps of the region.566 The governor also instructed him to contact the local authorities of Chiloé Island to help him organise the expedition, providing food, vessels and men to complete the crew, thus recognising the experience and expertise of Chiloé islanders and colonial authorities in regards the Patagonian environment.567

Lobato and his crew spent almost two months exploring and mapping the Patagonian region.568 As a result, the pilot of the expedition, Francisco Clemente y Miró, wrote a detailed account of the route followed by the crew on board the frigate Santa Bárbara and the piraguas Carmen and Rosario. Following the practices of scientific navigation, Clemente carefully recorded the route, the weather conditions, the situation of the winds and the location in latitude and

563 See Ricardo Donoso, El Marqués de Osorno Don Ambrosio Higgins: 1720-1801. (Santiago de Chile: Ediciones Universidad de Chile, 1941), 437.
564 Urbina, Fuentes para la Historia, 311.
565 Urbina, 310–12.
566 O’Higgins had a map of the region obtained from Captain José Joaquín Ostalaza; we do not know which map was. Urbina, 311.
567 Urbina, 311.
568 Urbina, 312.
longitude of key places. For example, in his survey of the Guitecas Islands, Clemente described the main channels, how they connected with the Pacific Ocean, and the location and resources of the main islands.\(^{569}\) In spite of their effort to carry on with the surveying, the continuous stormy weather negatively affected the condition of the piraguas, and it was decided to halt the expedition. The crew managed to survey the Patagonian coast only to 45 degrees south, failing to meet the goals set by Governor O’Higgins. Nevertheless, the time spent exploring the northern part of the Western Patagonian channels allowed them to assess the region. It was concluded that none of these islands had suitable natural ports, and the navigation through the interior channels was too risky, deeming, at the same time, West Patagonia as unworthy land to colonise.\(^{570}\)

New and accurate cartographical knowledge about the Patagonian channels was needed as the British presence in the southern oceans was felt more aggressively. The members of the expedition produced several maps, including particular plans of strategic places and general maritime charts. For example, the crew mapped Inche Island (Fig.3.6), the place where British vessels had landed in the 1740s; it was thought to be a good emergency port and was therefore carefully examined. The cartographic work of this expedition illustrates how widely spread were these scientific mapping practices by the end of the eighteenth century. As the map of Inche Island shows, the cartographies produced contained all the required information of formal hydrographical knowledge: longitude and latitude, scale, sounding depths, and the location of sandbanks, rocks, and seaweed, crucial for the navigation.

\(^{569}\) Urbina, 335–36.
\(^{570}\) Urbina, 336;338.
The results of the Lobato-Clemente expedition were incorporated to the Spanish cartographic body of knowledge. For example, the 1790’s chart of part of the Chilean coast (Fig.3.7) mapped by Malaspina’s crew shows how the surveys of Lobato’s enterprise were added to the cartographies produced by the metropolitan expedition. As can be seen in this figure, the members of the expedition added corrections (gluing a piece of paper) to a general map of West Patagonia which had been previously depicted. They incorporated the new data and cartographic knowledge produced by the Spanish American expedition. During their first visit to the Chilean colony, in 1790, the local expeditions to the western Patagonian channels had not been conducted yet; however, when Malaspina and his crew stopped in Chile on their way back to Spain, the colonial authorities shared the results of the new expedition. Furthermore, these results were incorporated in Lángara’s general map of South America (Fig.3.3). This is relevant as it shows the circulation of hydrographic and cartographic knowledge within the Spanish empire. It was usual that pilots or other members of the crew wrote several copies of their reports and maps, which were sent to the different regional and metropolitan authorities.
For instance, the results of Lobato’s surveys were expected to be sent to the viceroy of Peru and to the imperial authorities in Madrid, as the instructions of the expedition show.\footnote{Urbina, 312.}
Following the royal instructions of 1790, the viceroy of Francisco Gil (1733-1810) promoted a second series of hydrographical expeditions to the Patagonian channels. These expeditions were commanded by the pilot José de Moraleda, who conducted three consecutive exploratory voyages between 1793 and 1795 to Western Patagonia. These expeditions show the interest of the colonial authorities in Lima regarding the generation of knowledge about the Pacific region in general, and the geostrategic importance attached to the Patagonian channels in particular. For Gil, Patagonia had value as a connective region with the Atlantic. In his instructions, the viceroy commanded Moraleda to pay attention to any channel or passage that could connect the Pacific Ocean with the Atlantic Ocean.\textsuperscript{572} Gil was interested in surveying the Guaitecas archipelago and the continental coasts of Aysén, commanding Moraleda to produce new hydrographic knowledge, as well as maps of the region.\textsuperscript{573}

Moraleda’s surveys on the Patagonian channels showcase the consolidation of scientific navigation’s methods as the main way to survey and interpret the American seascape. His reports included the rigorous recording of location in longitudes and latitudes, the weather conditions and the situation of wind and currents.\textsuperscript{574} As with other hydrographers such as Malaspina and Cook before him, Moraleda’s account shows an acute knowledge of the results of the previous exploratory voyages. In his hydrographic report, Moraleda used and compared the knowledge produced by the Jesuits and Franciscans missionaries.\textsuperscript{575} He was also critical about previous hydrographical research, particularly Lobato and Clemente’s work, which he constantly rectified.\textsuperscript{576} Furthermore, he stressed the nonexistence of the mythical city of the Caesars, which some locals believed to be located in West Patagonia, dismantling previous geographical imaginings of the region.\textsuperscript{577}

As with the Spanish American expeditions of the mid-1700s discussed in chapter 1, the collaboration of indigenous actors remained crucial for the production of knowledge about the Patagonian channels. A thorough examination of Clemente’s and Moraleda’s voyage accounts shows how important were the indigenous actors for the exploratory tasks. Clemente’s report illustrates how these agents, called \textit{indios prácticos}, displayed crucial knowledge about the region’s navigation, pointing out where to anchor and refit the vessels.\textsuperscript{578} Moraleda’s reports

\textsuperscript{572} Urbina, 345, 427.
\textsuperscript{573} Urbina, 345.
\textsuperscript{574} Urbina, 356, 357, 359,391–396, 417,452.
\textsuperscript{575} Urbina, 356, 425 456.
\textsuperscript{576} Urbina, 358, 362.
\textsuperscript{577} Urbina, 425.
\textsuperscript{578} Urbina, 320.
demonstrates their importance in surveying uncharted territories. For example, as his crew studied the unmapped coast of Aysén, Moraleda had the collaboration of the Indian Pedro Yaña, who was used to navigate from Chiloé to Aysén as he raised cattle in the area. His knowledge was decisive for the success of Moraleda’s exploratory endeavours, as he advised when to navigate and where to anchor.\footnote{Urbina, 366.} In spite of the relevance of these actors, the implementation of the techniques and practices of scientific navigation rendered their contribution even more obscure than in the previous exploratory accounts. Their geographic knowledge was translated and codified under the practices of late-eighteenth-century hydrography and, therefore, was marginalised from the records and maps. Moraleda’s general chart of Patagonia (Fig. 3.8), illustrates this point. This chart shows previously uncharted islands and coastal lands of Western Patagonia, which he explored with Yaña and other \textit{prácticos}. Even though the role of these actors is not made explicit in the map, their presence can be appreciated in the indigenous names of these geographies, particularly in the names of the islands, rivers, and mountains. These names speak about a local knowledge of the Patagonian environment. This acknowledgement is significant because it contributes to Kapil Raj’s discussion about the asymmetries of power in knowledge circulation and the ways in which colonial hierarchies shaped the practices of scientific knowledge.\footnote{Kapil Raj, “Networks of Knowledge, or Spaces of Circulation? The Birth of British Cartography in Colonial South Asia in the Late Eighteenth Century,” \textit{Global Intellectual History} 2, no. 1 (2017): 49–66.} This perspective recognises the impact and importance of indigenous actors as coproducers of knowledge, while, at the same time, underscores the colonial power structure in which their actions were embedded. The information/knowledge difference is useful here. Subaltern actors, such as these indigenous sailors, had important knowledge about the region’s geography, resources, and ways of navigating the intricate and shallow waters of the Patagonian interior channels. However, this knowledge was treated as information, raw data to be used to construct scientific (and colonial) knowledge about this seascape.
Fig. 3.8. José de Moraleda, *General Chart of the Western Patagonian coast* (1796). Courtesy of British Library Board. Add MS 17676 E,
More than simply following the instructions of the imperial authorities, the colonial officers in Spanish America showed a clear engagement with the production of knowledge of the American coasts and seascapes. The active presence of British vessels in the Eastern Pacific since the mid-eighteenth century had systematically motivated viceroys and local governors to explore and survey American waters. Since the administration of viceroy Manuel de Amat y Junient (1704-1782) in the 1760s, Lima’s authorities took seriously their role as the guardians of the Spanish Pacific, prompting exploring voyages to the maritime region. According to Buschmann, during this period Lima’s geographical “radius stretched from the Falkland Islands in the southern Atlantic, over the Straits of Magellan and Cape Horn, and ended on the shores of the many islands in the Pacific”.

This engagement can be seen in the exploratory expeditions to Western Patagonia and to the Pacific islands of Rapa Nui (Easter Island, 1770-1771) and two voyages to Tahiti in the early 1770s. These expeditions tried to integrate these hitherto peripheral spaces into the areas of influence of the Peruvian viceroyalty. By the end of the colonial period, the viceroyalty of Peru had produced an important corpus of knowledge about the SEP, reaching from Patagonia in the South to Panamá in the North to the Pacific islands in the East. This knowledge, nevertheless, was only accessible to colonial authorities and officers of the Crown.

As the conflict with Britain arose in the early 1790s, this engagement with the production of knowledge about the Pacific continued, although it was restricted to the American rim. While Moraleda surveyed and mapped the Chilean rim and the Patagonian coasts in the 1780s and 90s, other pilots such as Andrés Baleato mapped the Peruvian coasts. Baleato also had an important role in copying and updating previous cartographies of the region, further contributing to the corpus of knowledge about the SEP. Furthermore, by 1797, pilot Alejandro González based in Montevideo, had produced an Atlas of the South American coasts, depicting the continental shores from southern Brazil on the Eastern side to the Peruvian littoral on the Western coast. Even though this document did not integrated the latest hydrographical knowledge about the SEP, it summarised all the local information available in

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582 For example, Baleato produced copies of the Spanish American expeditions to Tahiti, and reproduced particular charts of several Chilean bays from Spanish metropolitan cartographies. See, Museo Naval, MN 54 B-24, and MN 51-B-6.
583 Library of Congress G1701.P5 A8 1797: Atlas marítimo del reyno de el Perú, Chile, costa Patagónica oriental y occidental, construidas sobre las mejores, y mas modernas noticias de este continente, para uso del capitán y piloto de la carrera de Indias Dn. Alejandro Gonzales.1797.
the colonies about the South American shores. Presumably, it was produced to facilitate the regional navigation from the River Plate ports to the Peruvian and Chilean ports.

Moreover, during Gil’s administration, the Nautical Academy of Lima [Academia de Pilotaje] (1793) began to operate, becoming the first learning institution in South America to teach maritime sciences. Its first director was the captain Agustín de Mendoza y Argüedas, and important figures in Spanish American hydrography, such as aforementioned Baleato and Moraleda, worked as educators in the institution. The emergence of this institution represents local interest in expanding surveys and mapping endeavours in Spanish America. The inauguration of the Academy opened the field to the formal training of new Spanish American officers and pilots in the practices of scientific navigation. The students were trained in several fields, such as arithmetic, geometry, trigonometry, cosmography, drawing, mapmaking, and the usage of nautical instruments. The opening of the Nautical Academy represents the institutionalisation of the hydrographical endeavours developed in the region, validating the scientific knowledge produced in the American colonies. With the demise of the Spanish Empire in the Americas, this emergent locally generated knowledge about the South American sea and shores acquired political importance and potential. The following section explores how institutions such as the Lima Academy lay the foundations for the development of hydrographic knowledge developed in the early national periods, contributing to the political projects of the Spanish American Republics.

The first Chilean hydrographic expeditions

Spanish American nations, as Nicola Miller has noted, “may have not been founded on a territorial vision, but they quickly acquired one”. Right after the Independence, the new republican governments set different projects to map their territories, establish their borders, and survey the national space searching for resources. Hydrography became a strategic tool used by governments of the region to study, assess, and chart the coastal waters and shores, in order to integrate the seascape into their territorial sovereignty. Only in recent decades, historians have paid attention to the hydrographical expeditions led by Chilean Navy during the nineteenth century, highlighting their role in the construction of national seascapes and their

585 Miller, Republics of Knowledge, 143.
contribution to the production of knowledge about the SEP. Zenobio Saldivia, for example, has addressed the role of the Chilean Navy in the production, circulation and institutionalisation of scientific knowledge about the Chilean territory in the late-nineteenth century. Rafael Sagredo, on the other hand, has described the hydrographic expeditions during the late-eighteenth and nineteenth centuries in Chile. In particular, Sagredo has remarked upon the concomitance between the terrestrial expeditions with those conducted by the Chilean Navy to the coast, arguing how the hydrographic expeditions complemented the geographical and geological analyses of Claudio Gay, Rodulfo Philippi, and Amado Pissis. In spite of this historiographical interest, historians have not studied in depth the hydrographic expeditions developed in the early republican decades, focusing their attention in the period of institutionalization of hydrography by the end of the nineteenth century. Historians, such as Sagredo, have dismissed the first Chilean hydrographic expeditions, labelling them as sporadic events, conducted unsystematically. Yet, these expeditions illuminate important aspects about state-formation, representations of marine nature, and changes and continuities in knowledge production from the colonial to the early national periods. This section focuses on the first hydrographic expeditions conducted by the Chilean Navy during the 1830s and 1840s. It argues that these expeditions were instrumental to the interests of the Chilean Republic, particularly regarding knowledge about their coastal territory and how to use their natural resources. In doing so, it addresses the changes and continuities between the late colonial and the early republican periods, suggesting that the continuities were more important than noted previously.

In its origin, the Chilean Navy was created for military purposes. In particular, the Independence Wars of the late 1810s demonstrated the necessity of creating a naval squadron to defend the SEP against Spanish military forces. The patriot leader Bernardo O’Higgins had hired the services of the British Admiral Thomas Cochrane (1775-1860) to organise and command the Chilean Naval Forces. After consolidating the Independence of the Chilean Republic, the Chilean Navy set new plans to eradicate Spanish presence in the Americas, thus contributing to the independence of Peru in the early 1820s and defeating the Spanish forces garrisoned in Chiloé Island in 1826. However, the tasks of state-building in the 1830s and early 1840s led this institution to expand its role in the production of hydrographic knowledge about

586 Saldivia, *La Ciencia en el Chile*, 134.
588 Sagredo, 536.
the SEP. Specifically, the necessity of controlling the territorial sovereignty and having access to suitable ports mobilised Chilean national agents to conduct diverse survey enterprises along the SEP seascape. In 1832, the first expedition surveyed Quintero Bay. This was followed by a second expedition to survey Valdivia region in 1834, and two expeditions in the early 1840s to Mocha Island and Constitución Bay. Following the techniques of modern hydrography, the members of these expeditions carefully surveyed the littoral, producing new depictions that contributed to nationalised this seascape. Notably, these hydrographic expeditions generated the first maps of Chilean territory during the early republican period.

The 1834 expedition commanded by Roberto Simpson (1799-1877) to Valdivia demonstrates the consolidation of hydrographic practices in surveying the coasts of Spanish America. Simpson, a British-born nationalised Chilean naval officer, surveyed and mapped the coast of Valdivia, meticulously locating, describing, and measuring the region. The results of the expedition can be seen in the plan produced by Lieutenant Felipe Solo de Zaldivar. This chart (Fig.3.9) depicted the main geographical features of the coast, the direction of currents, stranding places and the depths of the bay. It also included other relevant information such as the location of shellfish fishing grounds and the routes that communicate with the interior valleys. Zaldivar’s chart is one of the first maps produced in Chile during the republican period. This map also illustrates the instrumental character of hydrographic enterprises. It focused on the hydrographical analysis of the mouth of the Bueno River. The central authorities in Santiago believed that the mouth of the river could be a good port for exporting local goods. They were particularly interested in promoting the agricultural production of Osorno and Los Llanos valleys. A good port, then, was central for the development of the local economy. Ultimately, Simpson dismissed this place as a suitable place to dock; nevertheless, a small harbour located seven miles south was considered to be a good port for mid-size vessels.

589 AHN, Fondo Ministerio de Marina, vol. 55.
590 AHN, Fondo Ministerio de Marina, vol. 55.
Fig. 3.9. Felipe Solo de Zaldivar, *Plan of the Bueno River mouth* (1835)\(^{591}\)

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For decades, historians have explored the relationship between science, especially natural history, and nation-building processes in Spanish America. This scholarship has emphasised the role of the natural sciences as essential tools for the construction of nation-states in the region and the commodification of natural environments. The hydrographic surveys produced by the Chilean Navy of the 1830s and early 1840s can be framed in this context. They were one of the first scientific enterprises conducted in the Chilean territory that sought to survey, chart, and assess the environment in order to take advantage of the local natural resources and plan future economic activities. They were instrumental to the central government ideas of local developments. The first hydrographic expedition to Quintero, for example, shows the desire of maritime authorities of Valparaíso to take advantage of the location of this natural port, conveniently located near the country’s capital.

The expedition to Quintero Bay was conducted by the pilot [primer piloto] Domingo Salamanca in April 1832. Salamanca’s crew was instructed by the Naval Commander-in-chief to explore this bay in order to enable its use as a port and to build a lazaretto, a building used for detention in quarantine. The construction of this facility would facilitate Chile’s goal to become a stepping stone in the transoceanic navigation from Europe to the Pacific, enabling the augmentation of port activities near Valparaíso. The conclusions of the survey were published by the newspaper El Mercurio de Valparaíso, which deemed the expedition a complete success and regarded it as an important scientific endeavour. According to Salamanca’s analysis, the natural harbours of Los Papagayos and Ventanas were not suitable for anchoring, but a third cove in the area was regarded as a suitable port and location for building the much needed lazaretto. Even though, the works to enable Quintero as port did not start until the 1860s, Salamanca’s expedition shows the way in which the government authorities were planning and projecting over the territory of the newly independent Republic as early as the 1830s.

The case of the expedition to Constitución Bay in 1843 is even more relevant to understanding the instrumentality of hydrographic expeditions to the project of Chile as a new nation-state and the commodification of nature. Constitución Bay had been used as a port to export the

592 See, McCook, States of Nature; Podgorny, “De los sapos, curas,”; Sanhueza, “El objetivo del Instituto.”
593 El Mercurio de Valparaíso, 17 April 1832.
594 El Mercurio de Valparaíso, 17 April 1832.
595 The lazaretto would be located in a second and smaller cove of Quintero. In addition, it was argued that the Papagayos cove (Caleta de Papagayos) and Ventana bay were not suitable for port activities as they were not deep enough and having rocks which made anchoring difficult. El Mercurio de Valparaíso, 17 April 1832.
goods produced in the Maule Valley since the late 1820s. However, as records show, there were many difficulties for the port due to the changing currents, the sandbanks brought in by the Maule River and the situation of the winds. These factors made this bay unsuitable for port activities, particularly during the winter season. For years, local port authorities had claimed the necessity of creating new knowledge about these coastal waters, highlighting the risks of shipwrecking due to the lack of proper knowledge of the bay’s hydrographical features. Due to these reasons, the government sent officer Leoncio Señoret to survey the Maule coast in order to examine the region and to present an accurate report of the area. After several days of surveying the littoral, Señoret concluded that the mouth of the river was not suitable for a port, confirming what was known by the local authorities. Nevertheless, the relevance of the economic activities of the Maule province made it necessary to find a good port in the region. In his assessment, Señoret was able to find a new anchoring place suitable for big vessels. As the map produced after the survey shows (Fig.3.10), the bay, named La Caleta, was conceived as an appropriate place to accommodate large vessels and for the development of a port. As a result, the central government in Santiago sent new instructions to the governor of the Maule province to enable the bay as an anchoring place. Moreover, aware of the economic potential for the region, the Chilean government sent another expedition to survey the coast of the province, principally to assess the Curanipe Bay, which was also considered a suitable port. As this case shows, the Chilean authorities in the central government understood that for proper exploitation of the natural resources of the region, knowledge of the coast was crucial. This is significant because it shows how from early on Spanish American authorities and science practitioners were driven by the strategic imperatives of territorial nationalism, as Nicola Miller has recently noted. This not only meant the demarcation of international borders and extending state control over disputed territories, as has been highlighted for the Chilean case, but also securing the access to natural resources, which, very importantly, included marine and coastal resources, such as port facilities.

596 During the late 1820s and the early 1830s there were many news about shipwrecks in the Maule coast. AHN, Fondo de Marina, vol. 32.
597 AHN, Fondo de Marina, vol. 32. Letter of Antonio Domingo del Río to the vice-President of Chile, 12 June 1831 and 5 July 1831.
598 AHN, Fondo de Marina, vol. 910.
599 Departamento de Guerra y Marina, Memoria que el ministro del Despacho en los Departamentos de Guerra y Marina Presenta al Congreso Nacional de 1843 (Santiago de Chile: Imprenta de la Opinión, 1843), 19.
600 Miller, Republics of Knowledge, 155
601 Historiography on the territorial nationalism in Chile has critically highlighted the political agenda of securing disputed territories and extending the national borders. See, for example: Mateo Martinic, “Magallanes en el ordenamiento territorial de Chile Republicano. Su expresión cartográfica (1853-1884),” Magallania 39, no. 2
In spite of the results of the hydrographic expeditions, pressing political and military matters during the 1830s and early 1840s, such as the organisation of the naval and military forces and the War against the Peru-Bolivian Confederation (1836-1839), put on hold the development of new surveys.\textsuperscript{602} The urgency of these matters meant that the hydrographical study of the coast of the country was not perceived of as a priority for the Chilean government. This explains why these scientific enterprises were not conducted systematically, assessing only particular bays and coves. Only by the second half of the 1800s, as the Chilean Republic attained stability and started territorial expansion towards the north and the far south, was a more systematic study of the SEP conducted.

\textsuperscript{602} Departamento de Guerra y Marina, 2.
Fig. 3.10. Leoncio Señoret, *Plan of Constitución Bay* (1843). Courtesy of Archivo Histórico Nacional, Ministerio de Marina, vol. 74
The study of these hydrographic expeditions also sheds some light on the changes and continuities in the practice of science between the late colonial and the early republican period by addressing the local capabilities that allowed pilots such as Salamanca and Zaldivar to produce scientific knowledge about the SEP. Existing historiography has highlighted the relevance of foreign scientists in the emergence of national scientific discourse in Chile. The work of Sanhueza regarding the influence of Hans Steffen in the development of Chilean geography and Sagredo’s research about the impact of Claudio Gay in the nation-building process are examples of this perspective. However, by highlighting the presence of foreign scientists that arrived in the country in the mid-nineteenth century, historians run the risk of over-emphasising the changes in scientific practice and knowledge brought by these individuals. Since the aforementioned hydrographical expeditions of the 1830s and 40s were led by Chileans and foreign naval officers, it seems relevant to address local institutions and capabilities in order to understand how knowledge was produced during this transitional period. I suggest that in addition to the role of foreigners in the emergence of its national sciences, the Spanish American Republics also had to create institutions that provided the cultural context and sufficient resources to produce knowledge about their environment. Having said this, it is important to highlight that the categories of foreign and national, particularly for the early republican period in Chile and Spanish America, were not rigid. Actors such Roberto Simpson and Leoncio Señoret were born in Britain and France, respectively. However, both men were nationalised Chileans, actively participating in the formation of a Chilean-based knowledge about the territory and the SEP’s coastal lands and waters.

In the case of hydrographic knowledge, there were some local and regional institutions that provided the cultural scenario that allowed for the development of the first Chilean expeditions. The aforementioned Nautical Academy of Lima, for example, contributed to the charting of the eastern Pacific and the formation of several generations of South American pilots during the late eighteenth and early nineteenth centuries. Following the example of Lima’s Academy, the new Spanish American Republics started to open their own academies (Cartagena in 1822 and Guayaquil in 1823). In Chile, Claudio Vila, a retired merchant marine pilot, presented a project to establish a nautical academy in Valparaíso in 1823. Vila’s idea was

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to create an institution to train pilots with expertise in both military and merchant navigation.\textsuperscript{605} The project was well received by the Chilean government. The minister José Ignacio Zenteno described it as useful and necessary for the progress of the country.\textsuperscript{606} Zenteno was concerned about the precarious status of the national navy, the dominance of foreign officers within this institution, and the vulnerability of the Chilean coasts in terms of defence; therefore, he understood that the creation of the nautical academy could solve many of these problems. Sadly, Vila died before the project could begin. In spite of this, the idea of establishing a nautical academy in Valparaíso was resumed a few months later by the pilot Francisco Arauco y Aguirre. Arauco presented a second project based on Vila’s ideas to the minister Zenteno. The project argued for the importance of creating a nautical academy, and it contained a set of rules and regulations.\textsuperscript{607} The project was approved in September 1823 by the President of the Republic, Ramón Freire, but ultimately the Nautical Academy of Valparaíso ceased operations after only a year.

Even though this project did not prosper, it shows the willingness of the Chilean government to create educational institutions to promote knowledge about navigation and hydrographical matters. As early as 1818, the government of Bernardo O’Higgins had created a similar institution, the Academia de Guardiamarinas, to train young officers from the Chilean Navy. It was thought that these men needed to be educated in the foundations of arithmetic, geometry, cosmography, navigation and the usage of nautical instruments.\textsuperscript{608} By 1834, the local government of the port city of Valparaíso had opened a new academy to train men in the science of navigation.\textsuperscript{609} The Nautical School of Valparaíso ran for a couple of years, educating pilots for the Chilean Navy as well as for the Chilean Merchant Marine. Domingo Salamanca was one of the teachers of this institution.\textsuperscript{610} Although one must be cautious about the effects of these institutions, particularly because they did not have long lives, it is worth noticing their value in terms of providing the cultural context in which the first Chilean hydrographical expeditions were developed. They demonstrate the emergence of local capabilities to produce scientific knowledge.

\textsuperscript{605} AHN, Fondo Ministerio de Marina, vol. 34.
\textsuperscript{606} AHN, Fondo Ministerio de Marina, vol. 34.
\textsuperscript{607} AHN, Fondo Ministerio de Marina, vol. 34.
\textsuperscript{609} El Mercurio de Valparaíso, 25 April 1834.
\textsuperscript{610} See, Jiménez, “La Academia Náutica.”
Furthermore, the emergence of these nautical institutions shows the ways in which people and knowledge circulated during the early republican period. The case of Francisco de Arauco y Aguirre is interesting because it allows us to think about the networks and circulation patterns of people during this period. Francisco de Arauco was born in Valparaíso and became a pilot after graduating from the Nautical Academy of Lima. He began his training as a third officer/mate [tercer piloto] in 1809 and finished his studies in 1822 when he obtained the degree of chief officer and pilot [primer piloto]. After his professional training, he moved back to Valparaíso to offer his service as a pilot and to become the director of the local Nautical Academy founded after independence. Even though there are no sources to study his career further, it is interesting to note the way in which the local elites were educated in the colonial centres of knowledge, like Lima, and how they circulated within the region. Additionally, Arauco’s career permits us to think more broadly about how the colonial educational institutions such as the Nautical Academy remained relevant during the early years of the republican period, not just for Peru, but for the continent. Indeed, what was learnt by Arauco in Lima’s Academy was considered instrumental for the development of the new Republic. As was argued by the government of Ramón Freire, the opening of a local Academy would constitute an important vehicle for the progress of public instruction and “national happiness”. Ultimately, this case demonstrates how the republican authorities in the early national period were ready to use colonial knowledge and institutions in order to foster their national projects. Moreover, these expeditions showcase early attempts to nationalise the sea and the production of its knowledge.

Conclusions

Hydrographic knowledge was instrumental both to defence of empire and to nation building in the Age of Revolutions. By analysing the cases of the exploratory voyages to the southern passages that connected the Atlantic Ocean with the Pacific Ocean, this chapter has demonstrated the crucial role of hydrography for the construction of imperial knowledge about the globe’s oceans and the development of imperial geographical imaginations. Both the Spanish and British empires conducted massive exploratory voyages to survey and map the

611 AHN, Fondo Ministerio de Marina, vol. 34.
612 AHN, Fondo Ministerio de Marina, vol. 34.
613 AHN, Fondo Ministerio de Marina, vol. 34.
area in order to determine the best route to pass from one ocean to the other safely and efficiently and, in the process, to improve their military and commercial navigation. Moreover, this chapter argued that knowledge produced by these expeditions was a key vehicle for imperial competition. British and Spanish imperial authorities alike used the results of the expeditions to extend their political and symbolic dominion across the region.

The study of the southern passage expeditions also shows the power politics involved in science during the Age of Revolutions. By the late-eighteenth century, the Spanish Crown was ready to compete against the other imperial powers to produce accurate knowledge about the strategic maritime passages, organising consecutive hydrographic expeditions that thoroughly surveyed the shores of Patagonia and Tierra del Fuego. In spite of these efforts, the British won the competition in the long run. Parker King and Fitz Roy’s voyages were two of the most important hydrographic enterprises of the day, producing voyages accounts published several times and in diverse languages, managing to build a global readership. Notably, the British expeditions made transoceanic navigation a more efficient and secure matter, enabling the development of steam navigation in the region. The circulation of the results of the Spanish expeditions, on the other hand, was more limited in comparison. Córdoba’s voyage account circulated widely among an educated elite, but it was translated into English only by 1820. Malaspina’s accounts, on the other hand, were not published at the time. His involvement in palace intrigue left his name in disgrace and his reputation stained, hindering all attempts of publishing the material collected by the expedition; instead, it remained for years in the deposits of the Spanish Hydrographic Office. The publication of maps by Felipé Bauzá was more successful. The data produced about the navigation in South America was widely known and used in commercial and military navigation. Yet, Malaspina’s analysis regarding the South Pacific hydrography and geography remained unknown.

The imperial rivalries between Spain and Britain did not entirely limit the circulation of the hydrographic expeditions’ results, however. On the contrary, a close analysis of the knowledge produced by these imperial enterprises reveals the transnational nature of their endeavours. As it was demonstrated through the expeditions of Malaspina, Moraleda, and Fitz Roy, hydrographers were constantly using, commenting on, and criticising the information and knowledge of previous explorations, regardless of the nationality of those conducting the expeditions. This “competitive collaboration” is one of the most important features of

614 Ritchie, *The Admiralty Chart*, 188.
knowledge production and transfer. In practical terms, this collaboration contributed to making transoceanic navigation safer and more efficient. This acknowledgement challenges previous historiographical research that focuses on a single empire or nation and fails to address the transnational connections and influences of these maritime scientific endeavours. By the late 1700s and early 1800s, hydrographers had generated a formal and transnational community of knowledge, with networks that circulated across the different empires. Nevertheless, this does not mean that the rivalries between empires did not affect the circulation of knowledge. It mattered greatly which nation produced the knowledge in the first place, and, as the analysis of Córdoba’s map showed, the imperial officers chose what knowledge to make public and available for competing powers.

This chapter has also demonstrated that far from being marginal in the production of knowledge about the Pacific region, the Spanish American colonies generated relevant hydrographic knowledge about the southern passages, particularly about the Patagonian channels. It demonstrated that the knowledge produced by the expeditions of Lobato-Clemente and Moraleda was instrumental for the production of imperial knowledge about the southern seascape, which was then used to foster military and commercial navigation of the Spanish Empire, as well as to reinforce its influence over this maritime space. The study of their map production offers a unique opportunity to explore how the Spanish American knowledge circulated within imperial networks: from the colonies to the metropolis, and between the different colonial territories. Crucially, this chapter showed that, by the late colonial period, the Spanish American territories had developed a locally produced corpus of knowledge about the SEP, as well as knowledge institutions of their own. With the dissolution of the Spanish Empire, this knowledge became a political tool used by the republican elites to support their political projects.

Similarly, this chapter studied the development of the first Chilean hydrographic expeditions of the 1830s and 1840s, arguing how instrumental these enterprises were for the nation-state building processes in Spanish America. These expeditions were early attempts of the republican regime to nationalise the seascape. At the core of these scientific enterprises stood the idea that the new Spanish American states had a territory, which often included a maritime space, that needed to be studied, appropriated, and utilised. Even though the results of these expeditions were limited or did not have immediate repercussions, they embodied contemporary ideas about the commodification of nature. The republican elites conceived nature as the territory on which the republic was founded, and as a source of resources that
could be exploited to benefit the nation-state. This is significant because it highlights the spatial and maritime dimensions of state-formation, contributing to historiography that focuses on the relationship between science and the state in Spanish America.

Notably, the study of these expeditions permitted me to examine the social and material aspects of science-making, stressing the importance of local knowledge capabilities for the development of early republican scientific enterprises. As this research has demonstrated, colonial institutions such as the Nautical Academy of Lima were used as models to create new knowledge institutions in the early republican period such as the Nautical Academy of Valparaíso. These institutions provided the framework for the development of the first national hydrographic expeditions. Moreover, as the cases of Domingo Salamanca, Felipe Solo de Zaldivar and Francisco de Arauco suggest, local individuals were important in the emergence of Spanish American institutions and the development of scientific practices and knowledge, particularly during the early republican years. This acknowledgement provides a more nuanced view than previous historiography, which over-emphasised the importance of foreign scientists to the foundations of the Chilean national science during the nineteenth century. As a result, this chapter showed that the continuities between the colonial period and the early republican period regarding science-making were more important than has hitherto been acknowledged.

The next chapter, ‘Nationalising geographies’ will continue exploring change and continuity from the colonial to the national period. In order to do so, this chapter will analyse the knowledge productions about the SEP’s islands and coastal lands created by Spanish American actors as the case of study. It will develop an overview of the knowledge of the SEP’s geographies from the early 1750s to the early 1840s, bringing together colonial and early geographical depictions of the SEP’s coastal lands. By focusing on these cases, the following chapter will challenge previous historiographical narratives that portrayed science in Chile as primarily a republican affair, emphasising the relevance of knowledge production of the late colonial period to the early representations of coastal geographical images and knowledge in the new republican regimes during the 1820s and 1830s. Moreover, this chapter will also address the important changes brought by the new republican regimes, highlighting the role of press and school texts books in the consumption and circulation of knowledge in the late period of the Age of Revolutions.
Chapter 4: Nationalising geographies: knowledge of the SEP’s Islands and coastal lands in the Age of Revolutions

In 1823, the new administration of Ramón Freire established a scientific commission to create a topographical map of the Chilean Republic.615 The Commission was also instructed to describe the geographical features of the country, including historical, economic and demographic information. To carry out the research, the government hired the services of the French engineers Charles Ambroise Lozier (1784-1865) and Joseph Backler D’Albe (1789-1824). Lozier’s team started the fieldwork in the coastal region of Concepción, where the expedition spent several weeks gathering the necessary information for the charting of the littoral and acquiring relevant geographical data. In spite of Lozier’s efforts, the material, political, and economic situation of the Chilean Republic made it impossible to complete the task. The arduous weather conditions, lack of proper equipment and the insufficient expertise of Lozier’s assistants, as well D’Albe’s reassignment to other military tasks, caused the scientific mission to fail. After months of work, they had only succeeded in mapping a few bays and their surrounding areas.616 Even though the results of the Commission were limited, their efforts demonstrate the importance attached to geographical knowledge by the governments of the new Spanish American republics. Recent historiography has highlighted how the Spanish American post-Independence regimes embraced the sciences to create knowledge about new countries and their territories.617 Various new republics moved to produce national atlases shortly after independence, not only to consolidate their own borders as neighbouring countries vied for larger territories but also to share their geographical visions with the world. In the same vein, scholarship on the late colonial period has also emphasised the importance and instrumentality of science in empire building.618 Daniela Bleichmar has

615 AHN, Fondo Ministerio de Interior, vol.315, f.282
617 Helen Cowie, Conquering Nature; Irina Podgorny, “La Ciencia de Mayo: La Cultura Científica en el Río de La Plata, 1800–1820,” Hispanic American Historical Review 93, no. 2 (2013): 312–13; Del Castillo, Crafting a Republic; Appelbaum, Mapping the Country of Regions; Sagredo, “De la hidrografía Imperial”.
highlighted the important role of science in allowing statesmen to visualise empire, which would in turn make it “moveable, knowable and—ideally—governable”. While previous studies have characterised independence as break with colonial geographical and scientific practices, this was often not the case, as recent scholarship has begun to argue thus far. As such, this chapter examines what was new about the scientific enterprises of the early post-independence period in Chile, exploring the development of geographical knowledge about the Chilean territory in the late eighteenth and early nineteenth centuries, particularly relating to coastal lands and islands. By doing so, this chapter argues that the systematic classification, rationalisation, and territorialisation of the Spanish American spaces was an ongoing process that started in the late colonial period and that was reinforced by the republican authorities during the early years of state formation.

After independence, the new Latin American republics needed to transform colonial spaces into national territories. This process has been described by Jürgen Osterhammel as the production of territoriality by modern nation-states. In his view, “territorialisation was bound up with the projection of the imagined shapes of the nation onto mappable space, with the formation of nation-states […], which was understood for the first time as control over countries rather than simply over trading spaces”. The control of the territory not only involved mapping, but also the delimitation of the sovereign national space, and its geographical description. Geography became instrumental to the nation-building process. However, this process of territorialisation did not emerge spontaneously during the nineteenth century in the Spanish American republics. Scholars such as Nancy Appelbaum and Mauricio Nieto have argued for the Colombian case, the study of the Chilean territory was not solely a product of nineteenth century scientists, as has been claimed previously. Building on these ideas, this chapter engages in the discussions of change and continuity from the colonial to the republican regimes, addressing knowledge production and geographical images of the SEP’s islands and coastal lands.

Monarquía; Sagredo, “De la hidrografía Imperial; Safier, Measuring the New World; Bleichmar, Visible Empire; Bleichmar, Science in the Spanish and Portuguese Empires; ; Barrera-Osorio, Experiencing Nature.

619 Bleichmar, Visible Empire, 7.

620 Irina Podgorny and Rafael Sagredo’s work has been most influential pointing out the continuities between colonial and republican science practices. Podgorny, “De los sapos, curas.”; Sagredo, “De la hidrografía imperial”.


622 Appelbaum, Mapping the Country; Sebastián Díaz, Santiago Muñoz, and Mauricio Nieto, Ensamblando la Nación. Cartografía y política en la historia de Colombia (Bogotá: Universidad de Los Andes, 2010); Nieto, Orden Natural.
Scholarship on the development of Geography in Chile has focused on the institutionalisation of this academic field. Particularly significant has been Carlos Sanhueza’s research, who has highlighted the work of Hans Steffen in the generation of a national corpus of geographical knowledge and his role in the institutionalisation of geography as a scholarly subject by the late 1800s. This emphasis on the institutionalisation of geography as a discipline, however, has led historians to overlook the contributions of geography as a research field. The production of systematic knowledge about Chile’s geography had its roots in the colonial period, as the imperial bureaucrats gathered and recorded information about the different regions, its inhabitants and resources.

As has been argued in this thesis, the development of geographical surveys was one of the most important tools that Spanish Empire created to control its overseas territories and establish its sovereignty. In the midst of the imperial rivalries of the Age of Revolutions, geographic knowledge gained even more political relevance. According to Adelman, during this there was a significant shift in the identification of empire, territoriality and sovereignty that changed the way in which empires implemented their policies in their overseas territories, and how they thought about and depicted the different regions. In this framework, colonial borderlands, such as the islands and coastal lands of the SEP, acquired more importance than in prior historical periods, since it was necessary to establish and define the territoriality of each competing empire. This chapter examines the roots of geographical knowledge in Chile during the late colonial period. It analyses the emergence of a distinct geographical discourse developed by colonial bureaucrats and military engineers, highlighting the instrumentality of it for the governance of the Spanish American territories. Furthermore, it explores how this colonial knowledge was used, transferred, and transformed by naturalists and other actors to shape the development of the national geography during the early republican period. To do so, it analyses the geographical reports and cartographies produced by colonial bureaucrats and officers about the Chilean littoral and islands during the late colonial period, as well their depiction in textbooks, press, reports and cartographies in the early republican period.

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624 Sanhueza, “El objetivo del Instituto”
625 Adelman, “An Age of Imperial Revolutions,” 324.
By exploring the roots of geographical knowledge and connecting it to imperial and nation-building processes, this chapter further contributes to the historiography that underscores the continuity from the colonial to the national periods.\footnote{Notable examples include, Jaime E. Rodríguez O., \textit{The Independence of Spanish America} (Cambridge: Cambridge University Press, 1998); Adelman, \textit{Sovereignty and Revolution}; Uribe-Uran, \textit{State and Society}; Adelman, “Iberian Passages”; Jocelyn-Holt, \textit{La Independencia de Chile}; Gabriel Paquette, “The Dissolution of The Spanish Atlantic Monarchy,” \textit{Historical Journal} 52, no. 1 (2009): 175–212; Brian Hamnett, \textit{La Política española en una Época Revolucionaria (1790-1820)} (México: Fondo de Cultura Económica, 2011); Matthew Brown and Gabriel Paquette, eds., \textit{Connections After Colonialism: Europe and Latin America in the 1820s} (Tuscaloosa: The University of Alabama Press, 2013); Paquette et al., “New Directions”; Gabriel Paquette, \textit{The European Seaborne Empires. From the Thirty Years’s War to the Age of Revolutions} (New Haven: Yale University Press, 2019).} Recent research in the history of Science in Latin America has stressed the important continuity from the colonial through to the republican regimes.\footnote{For example: Del Castillo, \textit{Crafting a Republic}; Appelbaum, \textit{Mapping the Country}.} For example, Irina Podgorny’s research on the River Plate demonstrates how during this period there were far more continuities than ruptures in the way in which scientific knowledge was produced. Podgorny describes how bureaucrats, technicians, and other professionals adapted to a new political setting, emphasising how the same scientific practices continued after independence.\footnote{Podgorny, “De los sapos, curas.”} Building on this work, this chapter argues that the new republics worked on the basis of proceedings, methodologies and knowledge developed prior to the Independence process. Furthermore, it suggests that early work on Chile’s geographical imagination about these coastal spaces and islands were drawn from colonial representations. The focus on continuity, however, does not obscure the significant transformations of the geographical imagination of Chile. During this period, there were important changes in the way in which the Chilean territory was imagined and projected.

This chapter is divided into two major sections. The first section addresses the instrumentality of geography for empire building. It focuses on the role of different actors, such as colonial bureaucrats and military engineers, in the process of territorialisation and construction of geographical knowledge about the SEP’s islands and coastal lands during the late colonial period. The second section poses several questions about the developments of Chilean geographical knowledge in the early republican period. It addresses the question of change and continuity in light of the dissolution of the Spanish Empire and the emergence of the republican regimes, exploring the methods, proceedings, and geographical imagination of Chile’s coasts and islands developed in the early national period.
Colonial bureaucrats and the territorialisation of Chile’s islands and coastal lands

The imperial competition between European powers in the second half of the eighteenth century bolstered the reforms implemented by the Spanish Crown in America. These reforms had significant consequences for the way in which the colonies and their natural spaces were perceived. As Nieto has studied for New Granada’s case, this process of reform involved the transformation from space to territory. This territorialisation of the Spanish American colonies comprehended a new way of understanding the space as an object to be rationalised, planned, and controlled. In this context, geography as a particular type of knowledge became an important analytical tool allowing colonial administrators to reorganise and classify the land, nature, and its inhabitants. According to Nieto, Spanish Enlightenment discourse introduced a strong connection between geography and politics. Building on this idea, this section further explores how geographic knowledge became a crucial tool of governance during the late colonial period as the imperial competition between Spain and Britain spiked. It argues how different actors such as colonial bureaucrats and military engineers contributed to the process of territorialisation and the emergence of a systematic knowledge about Chile’s islands and littoral.

In this framework of wide-reaching structural and political reform, change and adaptation, Bourbon bureaucrats and colonial authorities prompted new ways of understanding and rationalising the space of Spanish America during the second half of the eighteenth century. As Margarita Gascón has noted in the cases of the Southern Pampas and Araucanía, this required a reassessment of the geopolitical value of different spaces and localities. Thus, formerly peripheral and undervalued places gained relevance when framed in the imperial competition of the eighteenth century. The remote islands and peripheral coastline of the SEP acquired importance in this respect, as knowledge of their geography became a political asset.

José Perfecto de Salas: Chile’s first modern geographer

The territorialisation of colonial spaces involved important efforts of gathering information and producing knowledge about the different geographies. As Osterhammel has recognised, “the

629 Nieto, Orden Natural, 112.
630 Nieto, 102.
ordering of space required a central drive for rationalisation and the instrument to carry it through”. Aside from voyages of exploration, one of the most important and efficient ways of gathering information in the Spanish empire was via reports written by officers in situ. Nieto has analysed the relationship between geographical knowledge and political thought in the writings of New Granada’s enlightenment intellectuals and government officers, concluding that the instrumentality of geography was central to Enlightenment discourse in the viceroyalty of New Granada. In Chile, José Perfecto de Salas represents the figure of the enlightened Spanish American bureaucrat that produced geographical knowledge, and more importantly, understood it as a key instrument of territorial governance. Furthermore, Salas’ work prefigures the emergence of a systematic geographical knowledge about the Chilean territory, developed independently from other knowledge fields. Previous accounts, such as the sixteenth, seventeenth- and many eighteenth-century chronicles, integrated geographical analysis of Chile’s territory to the historical depiction of the colony.

José Perfecto de Salas has been singled out as one of the most important reform bureaucrats of Bourbon Chile. Born in Buenos Aires, he moved to Chile at a young age. He studied arts and theology in Santiago at the Jesuit educational institution, and received his doctorate in 1732. In order to extend his education, Salas moved to Lima to study Law at the Universidad de San Marcos, where he graduated as a lawyer in 1737. He subsequently had a prominent career in the colonial administration. Previous historiographical research has focused on his enlightened vision about justice, the state, and the social order. His geographical thought, however, has been overlooked. In his role as government assessor and bureaucrat, Salas developed a profound geographical knowledge of the South American colonies, particularly of Chile. As secretary to the governor of Chile and to the Viceroy of Peru in the 1750s and 1760s, Salas was involved in the production of two of the most important geographical works of mid-eighteenth-century Chile: the organisation of the 1756 Relaciones Geográficas [Geographic

632 Osterhammel, The Transformation of the World, 104.
633 Nieto, Orden Natural, 102.
635 José Toribio Medina, Diccionario Biográfico Colonial de Chile (Santiago de Chile: Imprenta Elzeviriana, 1906), 792.
636 Medina, 792.
637 Amunátegui Solar, “Don José Perfecto de Salas”; Donoso, Un Letrado Del Siglo XVIII.
Relations], and the report titled *Historia Geographica e Hirographica con el derrotero general, correlativo al plan de el Reyno de Chile* [sic] [Geographic and Hydrographic History of the Kingdom of Chile]

Ordered by the Council of the Indies, the *Relaciones Geográficas* were reports sent by imperial agents and bureaucrats answering detailed questions about the overseas territories, their population, infrastructure, taxes, natural resources, roads and systems of communication, among other relevant information. 638 Since the mid-sixteenth century, the metropolitan government had systematically sent out these questionnaires to be answered by the colonial authorities in the American territories. In the mid-eighteenth century, the Bourbon crown officers demanded new and updated geographical and demographic information about the South American colonies, particularly about the indigenous communities, urban spaces, and their natural resources, among other topics. In 1741, the metropolis published a specific decree that exorted the overseas imperial authorities to present reports on the geography and demography of the colonies. The provinces of New Spain were the only ones that submitted these reports. 639 Due to the importance of such knowledge, the Crown issued a new *Real Cédula* compelling the South American authorities to compile reports akin to the one produced in New Spain. In Chile, President Domingo Ortiz de Rosas instructed the *Audiencia* officer José Perfecto de Salas (1714-1778) to complete this task and to gather all the necessary geographical information about the territory and its inhabitants. 640

His role in the organisation, synthesis, and compilation of the *Relaciones Geográficas* is crucial to understanding Salas’ geographical thought. In particular, the process of organisation of the proceedings to gather the information are significant for discerning what the main geographical concerns were, and what information was valued by the colonial authorities. Salas organised a circuit of informants that allowed him to build a network of knowledge and geographical information through the completion of a predetermined set of questionnaires. Salas’ questionnaires were created to be answered and submitted by local colonial authorities in the diverse cities, villages, military enclaves, and parishes that comprised the kingdom of Chile. As has been argued by Francisco de Solano, these questionnaires differed in content and in


focus. For example, the questions varied according to whether they were to be sent to localities belonging to the bishopric of Santiago or to Concepción, or to the military outpost in the Araucanian region. Even though the reports that comprise the *Relaciones Geográficas* are not complete, there is sufficient information available to analyse the discourses surrounding coastal locations. This is important since it allows us to explore the methodologies and practices via which geographical knowledge about coastal places was generated. Salas’ questionnaires were completed by a variety of local authorities; the respondents often varying in position, profession and geographical expertise. In the case of coastal places and islands, the questionnaires were completed mainly by military officials who also fulfilled the roles of government administrators. Moreover, their analysis permits to study how these places were imagined in relation to the rest of the Chilean territory.

José Perfecto de Salas was the ideal candidate to implement the Crown’s orders to organise and compile geographical knowledge about the Chilean colony. As was argued by President Ortiz de Rosas, Doctor Salas had a “practical knowledge of the provinces of the kingdom”. In 1748, Salas had travelled by road from Santiago to Valdivia in order to rule over the Trial of Residence of the Governor of Valdivia, Juan Navarro Santaella. This experience shaped Salas’ geographical understanding of the colony, and encouraged his belief in the importance of gathering accurate and precise knowledge about the different regions in situ. His descriptions of the Chilean territory were compiled in a report written after his return to Santiago in March 1750. His representations of the Araucanian region portrayed positive images about the indigenous community hitherto signalled as cruel and savages, highlighting the potential for commercial improvements and the ways to make the colonial regime more efficient. As prior historiography has established, Salas’ representations were highly influential in the establishment of new relations between the Spanish and the Araucanian people in the 1760s, in particular with the creation of *poblaciones de indios* [Indigenous settlements] under President Antonio de Guill y Gonzaga. What he observed and experienced on this trip profoundly influenced his geographical understanding of Chile, and this knowledge would prove to be fundamental in his later work compiling the *Relaciones Geográficas*, and writing the *Historia Geographica e Hierographica*. Moreover, this report about the Araucanian region

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642 De Solano, 28.
provides an early example of how instrumental geographical knowledge was in Salas’ thought.\textsuperscript{645}

This instrumental vision of the territory can be fully analysed in the \textit{Relaciones Geográficas}, especially by looking at the questions Salas included in the questionnaires. Coastal places were valued according to their role in the imperial defence system. The questionnaires sent to island outposts and coastal villages tended to highlight military information, particularly regarding fortifications and armaments. These queries were incorporated into questions about population, commerce, resources, and religious information as was the norm with the rest of the Kingdom’s locales. The report sent from Valparaíso by Bartolomé González de Santallana on November 1755 illustrates this point. This report starts with a physical description of the bay and the village, followed by several examples of military information regarding the defence system: forts, weaponry, and ammunitions.\textsuperscript{646} Other information such as the main geographical features of the coast, the climate conditions, roads, and general administrative data about the local government and the institutions of the Catholic Church are secondary to the military information. The same can be observed in the information provided by the governor of Chiloé Islands, Antonio Narciso de Santa María (1716-1777). In his report, Santa María divided his analysis of the archipelago by the main urban centres: Castro, Chacao and Calbuco. The governor described the main characteristics of the bays, and generated knowledge about the human geography of these villages, such as demographic data, local government institutions, Indian towns, and Catholic institutions (parishes, Jesuits missions, educational institutions, and convents). In his general assessment of the situation of the islands, Santa María emphasised the importance of the region as the last Spanish enclave in the Pacific. The governor highlighted the fact that the archipelago had twenty-nine good ports, and only four fortifications, which made it extremely vulnerable to foreign invasions.\textsuperscript{647} According to Santa María, only by reinforcing the defence system of the archipelago could the defence of the Spanish empire in the South Pacific be ensured. He proposed building two new forts to strengthen the existing fortifications with new artillery, as well reinforcing the infantry troops by creating new companies in Chacao and a cavalry in Castro.\textsuperscript{648} Santa María’s geopolitical vision ultimately

\textsuperscript{645} Salas comprehended this coastal region as a space full of natural resources with a high potential for economic exploitation. Valdivia, for example, was characterised by the fertility of its soils, the abundance of timber, and fish in the seas, as well as the presence of gold and other metals. Furthermore, for him, the occupation of the Araucanian coastal land was considered a crucial space for the defence and connectivity of the colony, which was interrupted by Araucanian sovereignty.

\textsuperscript{646} De Solano, \textit{Relaciones Geográficas}, 88–89.

\textsuperscript{647} De Solano, 273.

\textsuperscript{648} De Solano, 273.
was realised when the defence system of the island was reinforced as the conflicts between Great Britain and Spain intensified during the 1760s.

Additionally, this report shows a shifting relationship between society and nature, as coastal places were beginning to be valued for the presence of fish and other animals. For example, the Corregidor of Melipilla, a locality in the Chilean central valley, detailly described the fish and molluscs captured by the local fisheries (San Antonio and Peña Blanca). This illustrates an incipient commodification of coastal places and marine nature in the mid-eighteenth century. It highlights how small littoral towns started to gain value as they had resources to be commodified and exploited for economic revenues.

Doctor Salas’ main geographical work was his Historia Geographica e Hriographica. Even though traditional historiography had ascribed its authorship to viceroy Manuel de Amat y Junient, recent scholarship has reattributed it to José Perfecto de Salas. The importance of this document is based on the development of a clear depiction of Chile’s territory. Salas created a written cartography of the colony from the coastal places in the Atacama Desert to the Patagonian bays on the Atlantic Ocean, describing the main geographical information of each known locality, and its location in relation to latitudes and longitudes. As Eduardo Cebrián has recognised, Salas’ Historia Geographica e Hriographica was written with a political and military objective. The document aimed to compile all the known geographical information and knowledge about the Chilean colony so that it could be utilised by the colonial government, as it provided data on the defence, population, commerce, natural resources, local government, Catholic Church presence along the territory, and local history. Furthermore, it represents the maturity of Salas’ methodologies for creating geographical knowledge since he included the information that he had observed and gathered on his journeys and the information provided by in-situ informants, as well as bibliographical information.

The compilation of the geographical and historical information about the different localities was a vast enterprise, particularly for territories about which little knowledge and information was available. However, as secretary of the viceroy Amat, Salas had access to a considerable amount of confidential knowledge. Notoriously, Salas deployed the knowledge produced by the Chiloé expeditions of the 1740s and 1750s in order to depict the main geographical features

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649 De Solano, 93–94.
650 Ramírez, “El Oidor Fiscal”; Donoso, Un Letrado del siglo XVIII.
651 Eduardo Cebrián, Historia Geographica e Hriographica con el Derrotero General, correlativo al plan de el Reyno de Chile (Santiago de Chile: Mago Editores, 2018), 9.
of the Western Patagonian seascape. Moreover, Salas incorporated historical and geographical knowledge from British accounts to further develop geographical understanding of the Patagonian channels. The knowledge provided by the Wager shipwreck accounts illuminated the description of the Guaitecas’ main island, while Anson’s narrative was a valuable source of information about the coasts of Eastern Patagonia, describing places such San Julián Bay in detail.

The knowledge generated in the Relaciones Geográficas was also widely used by Salas to construct his latest report. For example, in his description of San Antonio Bay, Dr. Salas reproduced the information given by Melipilla’s Corregidor, describing the features of the bay as well as its abundance of fish. His experience travelling across the Araucanian littoral also granted him crucial knowledge about this little-known region. This is the case for the mouths of the Laraquete and Carampangue Rivers as well as Valdivia and its surroundings, which are described in extensive detail. Other recurrent sources of information included Spanish travel accounts of crossing the SEP. To describe the features of key geopolitical locations, Salas integrated knowledge from seventeenth century Spanish accounts. For example, the geography of the Magellanic region was portrayed using the knowledge from the expedition conducted by the Nodal Brothers in 1618–19, as well as knowledge published in the Descripción geográfica y Derrotero de la región austral Magallánica [Geographical Description and course to the Magellan region] by Francisco Seijas y Loberas (1690).

Overall, Salas’ Historia Geographica e Hirographica summarises his main concerns: administration and defence. For Salas, the historical, geographical and hydrographical knowledge about the different cities, towns and localities was crucial for the government’s plans and politics, particularly regarding the new villages in the Central Valley and the Araucanian military outposts. In this vein, the coastal territories and islands were mainly

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652 For example, in his description of the Guaitecas archipelago, Salas took the knowledge provided by Abraham Evrad’s expedition to the Western Patagonian channels. Salas was able to synthesise Evrad’s report, describing the expedition’s maritime route, the main geographical features of the islands, their main bays, and brief information about the nomadic communities that lived on those coasts. Manuel Amat y Junient, “Historia Geographica e Hirographica con el Derrotero General, correlativo al plan del Reyno de Chile,” Revista Chilena de Historia y Geografía LVI, no. 60 (1928): 417.
654 Manuel Amat y Junient, “Historia Geographica e Hirographica con el Derrotero General, correlativo al plan del Reyno de Chile,” Revista Chilena de Historia y Geografía L, no. 54 (1924): 386.
655 Cebrián, Historia Geographica e Hirographica, 159-160; 199-207.
657 The reports of Salas as Justice officer further clarify this idea. See, Santiago Lorenzo, Origen de las ciudades chilenas. Las fundaciones del siglo XVIII. (Santiago de Chile: Andrés Bello, 1986), 26.
classified according to their role in the defence system of the empire. An example of this can be found in Salas’ geographical description of the Chiloé archipelago. Aside from describing villages and Indian towns, above all Salas emphasised the military aspects of the defence of Chiloé Islands, which integrated vast spaces in the continental coast (Carelmapu and its surroundings). For instance, he described the main features of Chacao’s Fort, its troops and cavalry companies, as well as detailing Chacao bay and the hazards of its sound.658 Similarly, on the continent, he listed the different bays, points used as observation posts, as well as describing the forts and the features of the different sounds in the region.659 When analysed as whole, the Chiloé archipelago emerges as a valuable node in the imperial defence network.

Due to the focus on defence in Salas’ geographical depiction, Chile’s southern islands were afforded considerable importance in his depiction of the colony’s territory. Small islands such as Santa María and Mocha, located near the coast of Biobio region, were described in geographical, physical, and historical terms.660 The case of Santa María Island is particularly interesting, as Salas depicted it as a space subject to foreign invasion. In Salas’ text, the island emerged as bountiful space inhabited by Indigenous communities that were forcibly removed because of the threat posed by British vessels in the SEP in the late 1710s.661 In this narrative, islands became vulnerable places, susceptible to the occupation of foreign powers. No other place was more vulnerable to foreign invasion than the islands located in Patagonia. In particular, the geography of the Magellan region emerged as a case of disputed geographies, where the Spanish knowledge was contrasted against British, French, and Dutch accounts.662

Salas’ geographical images about remote coastal places and islands can also be traced in other writings from this period. His depiction of the geography of the SEP was shared by Viceroy of Peru Manuel de Amat y Junient. In his memories, Amat created a special chapter dedicated to the description and analysis of Valdivia, and the Chiloé and Juan Fernández archipelagos. Similarly to Salas, the Viceroy characterised these three localities as sites vulnerable to foreign invasion, highlighting how other colonial powers could use them as stepping stones in their navigation across the Pacific Ocean.663 Amat compiled updated and precise information about

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659 Cebrián, 222–23.
661 Amat y Junient, 405–6.
662 The example of Madre de Dios Island is notorious as it contrasts Sarmiento de Gamboa’s description with British and Dutch accounts: Amat y Junient, “Historia Geographica e Hirographica”, no. 62, 317–18.
663 Biblioteca Nacional de España, “Relación que hizo de su Gobierno el exmo. Sor. Dn. Manuel de Amat y Juniet, Caballero del Orden de San Juan y Rl. de San Genaro, Teniente General de los Rs. Exercitos, Gentil Hombre de
these military outposts in order to inform and assess further actions of the colonial administration regarding this matter. According to the Viceroy, a stronger military presence was needed in these places, particularly following the British occupation of the Falkland Islands by Byron’s crew in the late 1760s. In the light of these events, Amat classified and labelled these maritime places as key sites for the security of the empire in the Pacific. Moreover, the defence triangle formed between the lands of Valdivia, Chiloé and the Juan Fernández Islands remained a crucial image in the Chilean geographical imagination, the SEP and its rim throughout the eighteenth century.

These imagined maritime geographies show us how peripheral places gained importance in the context of eighteenth-century imperial competition. The Spanish colonial authorities created several strategies in order to deal with the threat of occupation, which often involved thinking about these spaces at the local, regional, and imperial levels. The small island of Santa María, for example, was the subject of several political initiatives, which involved the relocation of the indigenous communities on the island after the navigation of the British sailors John Clipperton and George Shelvocke (1719) across the Pacific Ocean, and the re-population of the island with local people in the midst of the Napoleonic Wars at the beginning of the nineteenth century. These policies shows us how the geostrategic rationale permeated late colonial thought about the Chilean islands.

Finally, as the work of Salas has demonstrated, by the mid-eighteenth-century geography was deeply ingrained in colonial politics. In other words, geography as a specific type of knowledge became an increasingly important instrument for the colonial government and for the administration of the American territories. Spanish American bureaucrats such as Salas observed, rationalised, and classified the space, developing studies that determined the territories’ geographical features and resources. Furthermore, the analysis of his texts reveals the importance attached to remote islands and the Chilean littoral in the light of the imperial competition, which contrast with the “valley-centric” discourse that usually underlies historiographical work on Chile in the early modern period.

The role of military engineers in the development of geographical knowledge

The process of territorialisation of Spanish American space continued at an even faster pace over the last few decades of the 1700s. The involvement of Spain in international conflicts and the need to exploit the natural resources of its colonies saw the implementation of new projects to gather information and develop geographical knowledge about these diverse spaces. The role of military men, particularly of the military engineers, was crucial in this process. As Lafuente and López-Ocón have remarked, hundreds of military engineers “were sent to the colonies to explore and fortify the empire’s vulnerable areas”.665 Chilean coastal lands were considered one of the most vulnerable areas as the portals of the Spanish possessions in the Pacific. As the British presence in the South Atlantic increased throughout the eighteenth century, particularly after the 1760s, military engineers arrived in Chile to improve the colony’s defence and develop public works projects, such as the construction of roads, public buildings, canals, and to survey and map villages and cities, as historiography has highlighted.666 Military engineers, such as the Irish-born José Antonio Birt (d.1773) and Juan Garland (d.1775) were in charge of the expansion of the forts along the Valdivia coastline, the surveying of the Chiloé archipelago, and the maintenance and general inspection of the forts along the Mapuche border. Historian Jaime Rosenblitt has highlighted their role for the reorganisation of the defence systems of key coastal places and islands.667 Yet, this analysis of the military engineer’s role remains incomplete. As historians of cartography have highlighted, during the Enlightenment period, “engineers increased and diversified the uses of topography to fulfil the military and administrative needs of modernising states, giving rise to new institutions and techniques of surveying”.668 Building on this research, I additionally argue that military engineers were also

667 Rosenblitt, “La Ingeniería Militar”
crucial for the development of geographical knowledge about coastal places, and the rationalisation and territorialisation of the American coastal spaces on the base of their usefulness and instrumentality. Moreover, their work showcases the emergence of geographical knowledge that relied on the practice of direct observation and the systematic classification of space.

Educated by the *Real Cuerpo de Ingenieros Militares* in Barcelona, these engineers studied mathematics, geometry, architecture, drawing, physics and topography.\(^{669}\) This education professionally trained the engineers to undertake geographical assessments of the territories and create precise cartographic knowledge. The career of the military engineer José Antonio Birt is particularly illuminating in this respect. After arriving in the Spanish American colonies in the mid-1750s, Birt worked as a topographer and military engineer in several places across the continent, developing and organising defence systems. In the midst of the Seven Years’ War (1756-1763), Birt was sent to Chile to work to reinforce the defence system and manage public works. He worked on the fortification of Valparaíso, Valdivia, and Juan Fernández Island, as well as the planning of new forts to reinforce the defence of Concepción Bay and the Araucanian frontier.\(^{670}\)

As with other engineers working in Chile, Birt produced accounts and maps describing the geographies of the different places where he worked. Birt’s report on Juan Fernández Island, for example, offers us a detailed account of the fort and its geography, describing the island’s products and resources.\(^{671}\) According to Birt, it was of the utmost importance to acquire a “perfect knowledge” of the island.\(^ {672}\) He produced two cartographies, a plan of the fortification and a maritime chart of the island, which contributed to support the information and knowledge compiled in his report. In doing so, Birt rationalised and classified the space, producing new and instrumental knowledge about the island, which was relevant for reinforcing the defence system and improving the geographical knowledge about the SEP.

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669 Rosenblitt, 226.


As previously mentioned, in the mid-eighteenth-century nature was beginning to be commodified and projected to be exploited at an industrial scale, by the colonial administration, turning it as a source of wealth and profit. Various historiographical works have highlighted that the Bourbon officials turned to science in order to study, organise and classify the American space. Geography, as a specific type of knowledge, has often been overlooked in this historiographical research, which focuses mainly on the natural and medical sciences. Yet, geographical knowledge was instrumental in the exploitation of nature in Bourbon Spanish America. In particular, military engineers were crucial actors in extending and promoting this new understanding about nature, which can be seen in their analysis of marine and coastal spaces.

A clearer example of the instrumentality of geographical analysis and commodification of nature can be found in Pedro Rico’s analysis of the northern coast of Chile. In 1788 President Higgins visited the northern provinces of the colony in order to promote its commercial, farming, and mining activities, as well as to oversee the local administrations. On this visit, the President was accompanied by a series of professionals and technicians who assisted him. One of these professionals was the military engineer Pedro Rico. Rico was instructed to survey, and map the coastal northern region, and to develop a thorough assessment of the Papudo, Pichidangui, Caldera, and Huasco bays. In his analysis, Rico provided a precise description of the topography, location and natural resources found in each bay. For example, in his report on Pichidangui the engineer Rico stated that the port was unsuitable for commercial activities due to persistent strong headwinds. In contrast, Papudo bay emerged as a valuable place, suitable for port activities and fertile soils for producing legumes and vegetables. According to him, this small bay could also be used to promote conger eel fishing activities, and to take advantage of the good quality of the timber to build small vessels, further boosting the local industry. Furthermore, Rico’s reports featured key elements of the geographical sciences of the late eighteenth century. If, as Withers has argued, Enlightenment voyage accounts displayed several features crucial to the formation of geography as a modern empirical science, Rico’s

673 Cañizares-Esguerra, Nature, Empire and Nation; McCook, States of Nature; Cowie, Conquering Nature; Daniela Bleichmar, Visible Empire; Podgorny, “De Los Sapos, Curas”
675 Sagredo and González, La expedición de Malaspina, 658.
676 Sagredo and González, 656.
677 Sagredo and González, 656.
work exhibited two relevant ones: realism in description and systematic classification”. 678 These features became essential for geographical reports as they provided the methodological framework, which, in turn, added credibility and legitimacy to the knowledge produced.

Rico’s work also provides an example of the engineer’s role in the production of cartographic knowledge. According to José Moncada, drawing charts and maps was considered an important part of a military engineer’s work. 679 During his period serving the Crown in Chile, Rico produced charts of the aforementioned bays, as well as the ports of Quintero and Coquimbo. For example, Figure 4.1 shows the sketch of the plan of Papudo Bay where Rico depicted the main geographical features of the bay and its location using longitude and latitude. The map also included a small diagram of the village of La Ligua, founded in 1754. The other plans, like the one depicting Huasco bay (Fig. 4.2), introduced similar data for each coastal locality, depicting the main geographical features of these maritime spaces and linking them to villages in the valleys. What is significant about the charts produced by Rico is that they featured scarcely mapped places such as Huasco and Papudo, including in them recently founded villages like Vallenar and La Ligua that had been developed only in the second half of the eighteenth century. The development of these cartographies emphasised the importance of coastal places for the Higgins administration, which was concerned about security and the defence system of the SEP, and to promote different industries across the territory. In this scheme, even small localities acquired a renewed importance for the security, connection networks and economic development of the colony. Moreover, their production highlights the instrumentality of maps for the territorialisation of this coastal space.

678 According to Withers there were “three features crucial to the formation of geography as a modern empirical science: realism in description, systematic classification in collection, and comparative method in explanation”. See Withers, Placing the Enlightenment, 8.

Fig. 4.1. Pedro Rico, Sketch *Plan Port of Papudo* (1789). Courtesy of Museo Naval. MN 51-B-15

Fig. 4.2. Pedro Rico, *Plan of Huasco Bay* (1789). Courtesy of Memoria Chilena
What makes Rico’s reports special is the fact that these places were not usually the focus of geographical descriptions. These were considered marginal places in Chilean geography. Furthermore, not only did Rico present their description, he also linked these places to a broader economic geography and suggested new ways to exploit and develop these small bays and villages. His report on Huasco Bay is particularly important in this respect, as he portrayed it as a good port for shipping local mining exports. Instead of driving the mining products south to Coquimbo, the engineer argued that it would be more efficient to use the local bay for port activities. Further, he noted how this would boost local agricultural production and foster the timber industry by building vessels for the local maritime activities.  

Ultimately, Rico’s work was in line with that of the local colonial authorities, who promoted a variety of industries to develop the Kingdom’s economy. Rico’s assessments of the northern bays reinforced the ideas of subdelegado Víctor Ibáñez Corvera, and Governor Higgins’ views of how to improve the economy of the coastal regions. As I argued in Chapter Two, Higgins and Ibáñez implemented policies that promoted the establishment of local fisheries in the northern provinces to boost its commerce and industry. Furthermore, the circulation of Rico’s work on coastal places was not limited to the local authorities. They were also presented to Malaspina and his officers when they visited Chile in the early 1790s. A close analysis of the accounts of José Espinoza and Felipe Bauza, both members of Malaspina’s expedition, demonstrate how many of Rico and Ibáñez Corvera’s views of coastal nature were incorporated into their geographical overview of Chile’s northern littoral.  

The work of Rico shows that changes were taking place in military engineering practices, most notably, that engineers had started to expand their focus to concerns outside of defence. By the end of the 1700s, the military engineers were crucial in reinforcing the role of geography as an instrumental field of knowledge to describe, classify, and economically exploit the different territories that conformed the Chilean Kingdom. Perhaps no example of this is clearer than the work of the military engineer Francisco de Mendizabal. In 1797 he created a detailed report on the geography of the Juan Fernández Island for the Governor Higgins. The increase in tensions between Spain and Britain in the mid-1790s motivated Higgins to ask for detailed accounts of the island. In addition to the general geographical and military information about the defence
of the island, Mendizabal’s report analysed the usefulness of some of the island’s resources. For example, he analysed the soil’s composition and discerned how best to utilise it in order to benefit from the island’s natural wealth. The military engineer argued that the island had clay to make bricks and roof tiles, and lime and rocks to use as construction materials. The inclusion of these elements in Mendizabal’s report suggests a new way of understanding the nature of the island, not only as a military enclave, but also a place of production and economic exploitation. During the same period, other reports on the island also described and classified its natural elements, taking particular interest in the classification of its particular fauna.

Overall, the work of the military engineers such as Birt, Mendizabal, and Rico contributed to the rationalisation and territorialisation of the Chilean space and the production of geographical knowledge about the SEP. This knowledge was based on the understanding of geography as an empirical science that relied on direct observation and the thorough description of the spaces. By doing so, these engineers produced geographical images that highlighted the importance of coastal places in the Spanish empire defence system. By the late 1700s, these engineers’ reports also started to incorporate an instrumental view of nature, describing the natural elements of each space that they assessed as potential resources to be exploited, addressing their economic potential. Furthermore, the analysis of these military engineers’ discourses about coastal places traces the emergence of an instrumental vision of the marine environments, which still remain engrained in South American political and economic attitudes towards coastal localities. With the dissolution of the Spanish Empire in the Americas, the institutions and political frameworks that supported these actors ceased to exist. However, their knowledge productions, namely maps, reports, and general assessments of the territory, remained in the local archives, with the potential to be used by the new political forces.

**From colony to nation: knowledge production of Chile’s coastal geography**

Chile’s first written constitutions of the years 1822, 1823, 1828 and 1833 established the national territory, defining its boundaries as the Atacama in the north and Cape Horn in the south. They also established that this space included the adjacent islands. Where did this idea of the Chilean territory emerge? And why did these constitutions specifically address the

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686 See Constitutions of the Republic of Chile, years 1822, 1823, 1828 and 1833.
adjacent islands? I argue that this delimitation occurred in line with a previously formulated image of which spaces and places comprised Chile. Furthermore, this image is the product of the development of a geographical knowledge about this space. This section will therefore explore the territorialisation process in Chile as it became a nation-state during the first few decades of the republican government, and the ways in which this process was rooted in the knowledge and methodologies developed during the late colonial period. This means to challenge previous notions that understand the process that followed the Independence Wars as a period that brought about drastic changes to the archaic imperial structures and replaced them with new republican ones.  

In the last few decades, historians of science in Latin America have started to address the relationship between science and the new republican regimes. In her study of Natural History in Spanish America, Helen Cowie has argued that Independence actually disrupted scientific activity in that it “dissolved the existing scholarly projects”.  

However, more important than dissolution of scientific projects was the narrative created by the newly formed republican regimes that “presented the overthrow of Spanish rule as a major turning point for the scientific development of its American colonies”. Thus, science was presented mainly as a republican affair. The success of this narrative has limited historiographical evaluation of the changes and continuities in scientific studies in the region in the late eighteenth and early nineteenth centuries. In recent decades, historians such as Podgorny and Sagredo have addressed the commonalities between late colonial and early republican sciences, highlighting the legacies of colonial science practitioners into the nineteenth century. Building on this research, this section studies the development of geography, focusing on the changes and continuities of the practices and images produced by this discipline in the late colonial and early national periods. By doing so, this section addresses the different ways by which naturalists, scholars, and other republican actors transformed colonial geographical knowledge into national imaginaries.

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689 Cowie, 156.
The early republican geographical surveys

Geography was instrumental for the colonial elite’s project of exploiting natural resources and organising the society on productive terms.691 Similarly, the new republican governments of Spanish America sought to capitalise upon the knowledge they gained from sponsored geographical studies of their territories. Like other administrations in the region, the Chilean government of Ramón Freire (1823-1826) was determined to fund scientific enterprises to examine the country’s natural resources. Freire’s administration was especially interested in finding the best places to build ports and channels to improve communication, and new knowledge to promote farming and industry.692 At first, this task was given to Jean Josseph Dauxion Lavaysse (1775-1829) French-born traveller, amateur scientists and head of Chile’s first Museum of Natural History; however, this initiative did not prosper. Despite this, only a few months later, Freire’s government hired the French geographical engineer Charles Lozier and the military engineer Joseph Backler D’Albe to create a chorographic map of the country. Even though the results of the commission were a complete failure due to the lack of materials, equipment, and qualified personnel, the development of this survey shows continuity between the colonial and the national periods, particularly with regards the instrumentality attached to geographical studies to create knowledge of how to govern a determined space and its people.

Since the Lozier commission had a premature end, existing historiography has not analysed it in depth, labelling it purely as the first attempt to create a topographic map of the republic and the direct precedent of Claude Gay’s scientific endeavour.693 However, the aim of Lozier’s enterprise was greater than just the creation of a map. As the instructions given to the French geographers show, the commission had to create a census in order to acquire accurate demographic and geo-economic knowledge. According to the executive, the census would provide the data necessary for the administration of the republic, and for the development of national industry.694 This knowledge would also inform and support the new political and administrative regionalisation project initiated by Freire’s government.695

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692 Valentín Letelier, ed., *Sesiones de los Cuerpos Lejislativos de la República de Chile. De 1811 a 1845.*, vol. VII (Santiago de Chile: Imprenta Cervantes, 1889), 312.
694 AHN, Fondo Ministerio del Interior, fjs.84-84v.
In addition, Lozier’s methodology for acquiring demographic information was not entirely distinct from the methods used by José Perfecto de Salas in his *Relaciones Geográficas*. In her research on Colombia, Nancy Appelbaum has highlighted the importance of studying the visual and textual methodologies employed by the Chorographic Commission to envision the Colombian nation and its component parts. How the scientific enterprises gathered and constructed knowledge has become as important as the scientific discourses that they promoted. In this sense, there is an important continuation between the late colonial scientific practices and the ones used in the early period of the nation-state. As was the case for Salas, the methodologies created by Lozier and his team relied heavily on the knowledge of local authorities and parishes. Thus, the demographic data would be compiled from archival information of each parish, while Lozier’s assistant, Domingo Godoy, would be in charge of collecting information about the commercial, financial, material and moral condition of each place. This also highlights the collective nature of scientific endeavours, confirming what Daniela Bleichmar and Nicola Miller have examined for the eighteenth and nineteenth century Spanish America knowledge productions.

In 1830, the Conservative Chilean government hired the French naturalist Claude Gay (1800-1873) to study the Natural History of Chile, and gather information about its inhabitants and natural features. Contrary to the lack of attention received by Lozier’s commission, historiography has highlighted the role of Claude Gay in the development of Chile’s geographical imagination through its visual, cartographic, and historical work. For example, Zenobio Saldivia has addressed Gay’s role in the production of knowledge about the Chilean territory, framing his endeavours in the socio-political environment that enabled the institutionalisation of the Chilean sciences. In a similar vein, Rafael Sagredo has emphasised Gay’s contribution to the foundation of Chilean geography, particularly with regards to the definition of the national territory and the establishment of its borders. Furthermore, the historian has argued that Gay’s work summarised and synthesised much of the existing knowledge about Chile. Building on these ideas, I argue that in methodological terms and

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697 AHN, Fondo Ministerio del Interior, fjs.355v-356.
699 Saldivia, *La Ciencia en el Chile*, 40.
701 Sagredo, “El futuro de Chile,” 53.
regarding his contribution to knowledge about Chile’s coastal lands and islands, Gay based a lot of his work on Spanish colonial depictions of the Chilean territory. His contribution to the geography of the country was therefore not entirely new; in particular regions, his geographical depictions were based on the accumulation of existing knowledge.

Just as the military engineers of the late eighteenth century did, Gay considered geography an empirical science; therefore, his work was based on direct observation and systematic classification. However, Gay’s work also included considerable archival and bibliographical work. This is significant as it illuminates the way in which Gay constructed knowledge about the coastal places and maritime regions in Chile. Gay avidly read Molina, Ruiz and Pavon, Frezier, Feullié, Poepping, Miers, Cunning, Darwin, D’Orbigny, and D’Urville’s accounts to inform his research on the natural geography of the country.\footnote{Saldívia, \textit{La Ciencia en el Chile}, 45.} Similarly, in order to gather information about the exact location of coastal places, the French naturalist used, as well as compared and contrasted existing cartography. In an article published in the periodical \textit{El Araucano}, Gay explained the ways in which he contrasted the data raised by Malaspina’s expedition with more recent data collected by French officers.\footnote{\textit{El Araucano}, 22 August 1833.}

This archival work, particularly the consultation of Spanish charts, was crucial for the development of his own cartographic enterprise. For example, the chart of Mocha Island introduced in his \textit{Atlas} was a copy of the cartographic work produced by Joseph Ignacio Colmenares (1804). This map (Fig. 4.3) was the product of Colmenares and Mariano Isarbirivil’s survey on the coast of the SEP in the early nineteenth century. Their aim was to continue the cartographic enterprise started by the Malaspina’s expedition, charting the entire continental coastline from Chiloé to Panamá.\footnote{Nicolás Anrique, \textit{Biblioteca Geográfioco-Hidrográfioco de Chile. Segunda Serie} (Santiago de Chile: Imprenta Elzeviriana, 1898), 3–4.} Likewise, the chart of Juan Fernández Island (Fig. 4.4) was an exact replica of the cartographic work on the island produced during the administration of local governor Fernando Amador de Amaya in the 1790s. Under orders from the Viceroy of Peru, President Higgins had sent the military engineer Francisco Mendizabal to survey the island, producing a map of its geography.\footnote{AHN, Fondo Varios, vol. 427, fj. 274.} Moreover, for the depiction of the Western Patagonian Channels, Gay copied the work of José de Moraleda to produce a chart of Chonos archipelago (Fig. 4.5) and the cartographic work of the British officers Phillip Parker King and Robert Fitz-Roy to represent the southernmost Patagonian channels and the Magellan
Strait. As Patience Schell has recognised, Fitz-Roy’s material had become very helpful, “especially for regions Gay had not visited”. In this vein, it is important to stress the way in which Gay not only created new knowledge about the Chilean territory, but also how he used and transformed knowledge that was made to reinforce imperial geographies in order to produce new geographical imaginations of Chile as a nation-state. By including them in his *Atlas*, the Spanish colonial maps and British naval charts were reframed in a new context to promote the idea that these maritime spaces were part of the national territory. Furthermore, by compiling this cartographic and visual information in a uniform format, Gay was able to disseminate these images not only to the Chilean public, but also opened it to a (educated) global readership.

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706 Schell, *The Sociable Sciences*, 121.
Fig. 4.3. Claude Gay, *Chart of Mocha Island* (1854)

Fig. 4.4. Claude Gay, *Chart of Juan Fernández Island* (1854). Courtesy Memoria Chilena

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In his book about Claude Gay’s role in the formation the Chilean national identity, Luis Mizón has emphasised the “modernity of his methods”\textsuperscript{709} However, a closer examination of Gay’s methodology challenges this perspective, as he used traditional techniques to gather geographical information. Similarly to Lozier and José Perfecto de Salas, Gay created questionnaires to gather information about the different localities that conformed the Chilean territory. His questions focused on demography (particularly how to classify the population),

\textsuperscript{708} Gay.
\textsuperscript{709} Luis Mizón, \textit{Claudio Gay y la Formación de la Identidad Cultural Chilena} (Santiago de Chile: Editorial Universitaria, 2001), 118.
local economy and resources, and the religious institutions. What is unique about Gay’s questionnaires, though, is his queries about the social sphere, that particularly addressed medical care, crime, penal population, and details about the local prisons. These concerns about the collection of relevant social data would prompt his involvement in the creation of the National Statistics Office by the mid-nineteenth century, which in turn modernised the administration and process of state building in Chile. Moreover, as has been noted by Berrios and Saldivia, Gay frequently incorporated in his description about Chilean native flora and fauna data produced by local informants. This is significant because it addresses the collective nature of Gay’s knowledge production, emphasising the importance of his local networks of information. This information then, was standardised, classified and incorporated to scientific language and practices of modern geography and natural history.

In sum, Lozier and Gay’s research shows us some important examples of continuity from the colonial period in the way that geographical knowledge was perceived and produced. Firstly, geography continued to be valued as an instrumental science relevant for the government of both people and the space. Secondly, in terms of methodologies and practices, these researchers also relied on questionnaires to produce new knowledge about the country’s diverse geography, similarly to the way in which Spanish bureaucrats produced new spatial knowledge. This also highlights the importance of local and in-situ informants, both in the colonial and early national periods, who actively collaborated in the production of geographic knowledge. Finally, as the cartographic work of Gay has demonstrated, there was a significant transfer of geographical and cartographic knowledge from the colonial to the national period. The content of these images though, was transformed and reframed to fit the new republican narrative.

Change and continuity in Chile’s geographical imaginings

In 1838, Chilean writer José Victorino Lastarria (1817-1888) published his book Lecciones de Geografía Moderna [sic] [Lessons of Modern Geography]. The book was designed as a geography textbook for learning the foundations of the physical and political geography of the different countries on the globe. As a geography teacher at a private school in Santiago, Lastarria wrote this book due to the need for pedagogical material to support his teaching. As

710 Mizón, 118–19.
711 Mizón, 119.
primary schools opened across Chile’s main cities, school textbooks became increasingly popular; Lastarria’s textbook, for example, was republished several times during the 1840s. In the introduction of book, the author established the importance of educating the American youth about the world’s geography, particularly addressing the importance of knowing the geography of their homeland.713 He argued that the Chilean youth needed to be educated with the most recent and accurate information about their country.714 Lastarria’s textbook represents an interesting starting point for analysing the development of Chile’s geography in terms of the changes and continuities of both the discipline and the geographical imagination about the Chilean territory from the colonial period to the early republican period.

Lastarria’s textbook also offers an important insight into the circulation of geographical knowledge in the Atlantic world. Geography textbooks circulated widely in the late eighteenth and early nineteenth centuries in the Atlantic world. Most of the textbooks that circulated in the Spanish-speaking world were translations of French authors who wrote these pedagogical materials at the turn of the century.715 These publications were predominantly made by armchair intellectuals who organised, classified, and summarised geographical knowledge available. Their role was to disseminate knowledge about the countries of the world to a wide readership. The public sale of these textbooks, usually advertised in local newspapers, demonstrates how they were produced and printed to be actively sold on the open market and, therefore, reach a broad audience.716 Lastarria’s book, for example, was advertised in the local newspapers as the most popular book of its kind.717

Scholars have argued that the content of these textbooks was far from original, addressing the fact that most of them were close copies of other texts.718 Plagiarism was a common practice in the production of these textbooks. For example, in the introduction of his work, Lastarria recognised that he used material provided by the textbooks of Balbi, Malte-Brun, Crozat, Letronne and Alcalá.719 Nevertheless, the transfer of geographical knowledge was not entirely passive. As Lastarria’s textbook demonstrates, the book was adapted to local conditions,

713 José Victorino Lastarria, Lecciones de Geografía Moderna Escrita Por J.V. Lastarria, para la enseñanza de la Juventud Americana. Obra adoptada en los establecimientos de educación de Chile, y la mayor parte de las otras repúblicas Hispano-Americanas, cuarta (Valparaíso: Imprenta del Mercurio, 1846), v.
714 Lastarria, vi.
715 Horacio Capel et al., Ciencia para la Burguesía (Barcelona: Universitat de Barcelona, 1983), 89.
716 The relatively cheap price of these textbooks also supports their increasing popularity and consumption. See, El Mercurio de Valparaíso, 19 June 1839.
717 El Mercurio de Valparaíso, 9 December 1940. Also see El Araucano, 21-28 June 1839; El Mercurio de Valparaíso, 28 June, for other advertisements.
718 Capel et al., Ciencia para la Burguesía, 92.
719 Lastarria, Lecciones de Geografía Moderna, vi.
information, and knowledge. Thus, the description of the Chilean geography was far longer and more detailed than that of the other regions and countries of the world. This in particular shows the political and ideological role of geography as a school subject in the context of the new republic.

Geography as a school subject increased in popularity during the first half of the nineteenth century. As has been argued by Horacio Capel, geography was considered by the governments as relevant to the cultural and ideological education of students, who would learn about the nation and its territorial organisation. In Chile, geography started to be developed as a school subject and as an academic field in the early nineteenth century. The Franciscan José María de Bazaguchiascúa opened the first academic geography course in the Academia de San Luis in 1809. In a reflection written a few years after, in the midst of the Independence process, Bazaguchiascúa highlighted the instrumentality of the field for the formation and education of every citizen, but particularly those engaged in government, military, and religious activities.

Paloma Miranda has characterised this period in Chilean geography as pre-scientific or descriptive, the main concern of which was the description of the earth’s surface. The works of Bazaguchiascúa as well as Lastarria are framed in this descriptive paradigm, promoting a classical view of the discipline, relating it to the sciences, particularly to maths and cosmography, and later to history. An example of this can be found in the organisation of Lastarria’s textbook, which is divided into several chapters that discuss general knowledge of the universe, cosmography and the planets, including aspects of the hydrography, political and physical geography of the world’s countries.

Geography textbooks, such as the one produced by Lastarria, and the volume published by Tomás Godoy Cruz in 1839, helped to introduce the geographical imagination of Chile to a wider readership, and established geography as a school subject necessary for educating new citizens. This idea had already been proposed by several people in the 1830s. For example, in April 1837, El Mercurio de Valparaíso published a column highlighting the necessity to educate the young students in the knowledge of history and geography of the country in order to enhance their patriotic sentiments as well as their moral behaviour. The author also considered geography to be instrumental for generating knowledge about the territory’s natural

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720 Capel et al., Ciencia para la Burguesía, 6.
722 Miranda, “La educación geográfica en Chile,” 52.
723 El Mercurio Chileno, N°10, 1 January 1829, 452.
724 El Mercurio de Valparaíso, 4 April 1837.
resources, and creating policies to promote national industry. In the same periodical, a reader identified as a ‘a family man’ wrote a column praising the publication of Lastarria’s textbook, highlighting the importance of the work to the education of young children and the diffusion of enlightenment thought, particularly about the geography of the country. As well as the other natural sciences, the study and practice of geography was framed in what Patience Schell has labelled as the discourse of beneficial science, which highlights the value of scientific endeavours as beneficial for both society and individuals.

It has often been argued that nineteenth-century Latin American geography was profoundly shaped by German naturalist Alexander von Humboldt’s ideas and concepts. Specifically, Humboldt’s classical division of American geography in three main zones (coasts, valleys and mountains) has been deemed crucial for the study and classification of South American geography and ecosystems in the nineteenth century. However, a closer examination of the aforementioned geography textbooks challenge this idea. In a similar fashion to other geographers of the period, Lastarria used Balbi’s template to divide and organise the geographical knowledge, splitting his analysis into two main categories: physical and political geography. Particularly interesting is the way in which Lastarria transferred European geographical models (Balbi’s template) and created a narrative based on Spanish American knowledge. For example, to present the physical geography of Chile, Lastarria used the information and knowledge provided by Juan Ignacio Molina. In his Saggio sulla storia naturale de Chili, Molina divided the country into islands, mountains, and what he called a ‘mid-space’. In his textbook, Lastarria divided the physical geography of the country into islands, continent (tierra firme), and mountains. Furthermore, he used the knowledge from Molina’s book to describe the islands. The importance given to the islands as a specific geographical feature therefore marks a departure from typical Humboldtian classifications of South American geography.

The fact that Molina’s geography was so influential in Lastarria’s geographical imagination of the country, particularly in the division and classification of its geography, highlights the

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725 El Mercurio de Valparaíso, 4 April 1837.
726 El Mercurio de Valparaíso, 15 September 1838.
727 Schell, “Natural History Values and Meanings”
728 Appelbaum, Mapping the Country; Sagredo, “De la Naturaleza a la Representación”; Sagredo, Ciencia-Mundo; Cañizares-Esguerra, Nature, Empire and Nation.
729 Appelbaum, Mapping the Country, 38.
730 Molina, Compendio de la Historia Geográfica, 5.
continuity of colonial images in early depictions of Chile in the republican period. Humboldtian models of South American geography were not transferred as quickly and as widely as has been argued, as it can be seen in geographical textbooks produced for a wider readership such as the school textbooks. This would also indicate a gap between what was taught to children and young students at school and the research that was simultaneously being conducted by foreign science practitioners. Lastarria’s textbook reproduced the geographical imagination of Chile that were already circulating, adapting it to the new conditions of the territorial borders of the nation-state. Indeed, Lastarria produced an expansionist image of Chile’s territory, extending the country’s historical and territorial sovereignty to the coasts of Cape Horn in order to match the borders established in the Chilean Constitution. For Molina, on the contrary, the limits of the Chilean territory were ethnocultural, highlighting the idea that the people living in Patagonia and southwards were different to Chileans in terms of their features, costumes, and language. This meant that, for Molina, the boundaries of the Chilean colonial territory extended from the Atacama Desert to the Mapuche Frontier. Furthermore, Lastarria included news of the recently founded Chilean colony on the Magellan Strait in his textbook in order to incorporate this remote region into the geopolitical sphere of the Chilean Republic.

In addition to the school textbooks, newspapers had an important role in the circulation of news and knowledge about the geography of the country. During the early republican period, periodicals such as El Araucano, El Mercurio de Chile, and El Mercurio de Valparaíso frequently showcased news about the different regions that comprised the Chilean territory. According to Saldívia, these periodicals contributed to the consolidation of the Chilean nation-state because of their role in the reinforcement of the government’s policies, and their key role in the divulgation of science in general. These periodicals featured news and discoveries about the most important scientific expeditions of the period, including news about the expeditions of Miers, Poepping, d’Urville, and Parker King and Fitz Roy’s voyage, circulating the results of their expeditions and reviews of their work, and particularly addressing the discoveries and news about Chile. These news items usually featured remote and isolated

731 The fertility of Chilean soil and the extremely favourable climatic conditions are topics often reproduced in the colonial geographical imagination of Chile which Molina further reinforced in his book. These ideas were also transferred into Lastarria’s geographical depiction of the country.
732 Molina, Compendio de La Historia Geográfica, 3.
733 Lastarria, Lecciones de Geografía Moderna, 105.
734 Saldívia, La Ciencia en el Chile, 46.
places like the Western Patagonian Islands and Chiloé Archipelago. Furthermore, due to the political climate of the late 1820s and 1830s, these periodicals introduced news about contested geographies. Juan Fernández Island, for example, was frequently addressed in the newspapers at the height of internal and external conflicts, as the island was perceived as a contested area which could easily fall into the hands of enemy forces. Moreover, the potential usage of Juan Fernández, as well as Chiloé, Mocha, and Huafo Islands as penal colonies was a subject of an ongoing debate. Additionally, *El Mercurio de Valparaíso* introduced frequent news of shipwrecks along the coasts of Chile, integrating remote places’ news into the geographical imagery of the Chilean territory. The regularity of news about the Chilean islands in the local newspapers show a more important presence of the islands and coastal lands to the geographical imagination of the country than hitherto has been recognised. Indeed, by frequently writing about them, these islands and coastal places were being added to the collective imaginations and understanding of the Chilean national space.

The analysis of these early depictions nuance scholarly representations of Chile that have emphasised the importance of the Andes mountains in the national imagery. Existing scholarship has overlooked the place of the sea and coastal lands when it comes to the study of social representations of the national, as Sagredo has acknowledged. Recent research has focused on the geographical images produced by Gay, Pissis, and Rugendas, among others, who were highly influenced by Humboldtian representations of South American nature, which has tended to emphasise the presence of the Andes over other representations of landscape. However, a closer examination of different primary sources, such as the press and geography textbooks, question this historiographical image, particularly with regards the early stages of the republican period. Furthermore, the permanence and relatively high importance of the islands and coastal lands in these documents indicates a continuation of colonial images into the early republican ones.

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738 As a penal colony, Juan Fernández was closed in 1834. In 1843 the public discussion of islands as penal colonies opened again *El Araucano*, 2 April 1834, 30 June 1843.
739 For example, *El Mercurio de Valparaíso* published news about shipwrecks of Mocha Island, 10 August 1833, in the coast La Imperial, 7 June 1828, the coast of the Maule region, 6 December 1828, in Juan Fernández Island 20 December 1828, Valdivia, 24 July 1830, round Cape Horn, 17 November 1830.
Yet, despite their repeated mentions in the press and in geographical documents such as school textbooks, imaginaries of the SEP’s islands and coastal locations had changed by the mid-nineteenth century. In particular, the publication of Gay’s research in the press in the 1830s introduced important changes in the perception of the SEP’s islands. In the case of Juan Fernández Island, Gay broadly described the main features of the island and the unique aspects of its flora and fauna.\textsuperscript{742} Valdivia and Chiloé, on the other hand, were depicted as relevant places for the study of the natural sciences, particularly to geology and natural history.\textsuperscript{743} As has been recognised by Saldívia for the case of Chiloé Island, coastal places were transformed into natural laboratories.\textsuperscript{744} While these localities gained scientific value due to their biodiversity and unique geographical features, they lost much of the geostrategic relevance attributed to them by the Spanish and the British in eighteenth century accounts. In Gay’s scientific narrative, they were no longer perceived as relevant places in the context of competition between empires, nor were they thought to be particularly important in the nation building process. They had become just another element, one of the many, of the country’s diverse geography.

Gay’s cartographic representations of Chile allow us to delve further into the geographical imagination of the country. His \textit{Atlas de la Historia Física y Política de Chile} [Atlas of the Physical and Political History of Chile] had a crucial role on the development of Chilean imagery, and more generally, in the process of nation building as has been argued by Sagredo and Schell.\textsuperscript{745} Published in 1854, this volume integrates 315 images representing the Chilean landscape, culture and history. Notably, the \textit{Atlas} included a general map of Chile’s territory, twelve regional maps, and eight plans of diverse locales and cities. The cartographic production has been granted as one of Gay’s most important endeavours and contributions to the body of knowledge about Chile’s territory.\textsuperscript{746} In particular, he invested considerable efforts into the creation of a new general map of the Chilean republic. He was especially interested in producing new scientific cartographic knowledge about Chile’s hinterlands. In a press article, the French naturalist claimed that the interior lands were scarcely known and their cartographic

\textsuperscript{742} \textit{El Araucano}, 3 March 1832.  
\textsuperscript{743} \textit{El Araucano}, 8 July 1836.  
\textsuperscript{744} Saldívia, \textit{La Ciencia en el Chile}, 83.  
\textsuperscript{746} Rafael Sagredo, “El Atlas de Claude Gay y la representación de Chile”, \textit{Cahiers des Amériques latines} [Online], 43 (2003), 131. For more information about the context of production and publication of Gay work see Sagredo, “Ciencia, Historia, y arte”.  

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representations were preposterous. In order to validate his work, Gay argued for the utility and necessity of precise knowledge of these lands for the Chilean government, since accurate maps would facilitate administration and governance. Even though he recognised that knowledge of the islands and coastal lands was inaccurate, his energies were mainly invested in the topographic mapping of the Chilean hinterlands. A close examination of his sketch map of the Chilean Republic (Fig. 4.6) highlights precisely this interest, depicting with utmost detail the main geographical features. Gay focused here in particular on the depiction of rivers and mountains.

Gay’s interest in the hinterlands represents a prominent shift in the visual and cartographic representation of Chile. Most late colonial maps focused on the coastline. The examination of Moraleda’s general overview of the coast (Fig. 4.7), for example, or the works on particular bays and islands of the military engineers emphasise the relevance of Chile as geostrategic maritime place in the geographical imagination of the Spanish empire. Gay’s focus on the hinterlands, therefore, marked a departure from the colonial representations. Chile, from this moment on, would mostly be represented in its continental character. The work of Amadeo Pissis in the second half of the nineteenth century, and the cartography that depicts the expansion of the Chilean state towards the Araucanian frontier, as Jaime Rosenblitt has explained, were created to emphasise Chile’s continental position and the main topographical features of the hinterlands. The fact that these maritime representations were becoming marginal in the national imagery of the country may be related to the consolidation of the power of the Santiago elite, who promoted images of the Central Valley (with the backdrop of the Andes) as the true image of Chile. As can be seen in the maps and drawings of his Atlas, Gay’s published work, reinforced the Santiago elite’s project, highlighting the importance of the hinterlands at the expense of the coastal lands.

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747 *El Araucano*, 8 July 1836.
748 *El Araucano*, 8 July 1836.
749 See Rosenblitt, “Al Borde del Imperio”
Fig. 4.6. Claude Gay, Sketch *Map of the Republic of Chile* (1836). Courtesy Memoria Chilena.
Fig. 4.7: José de Moraleda, *Chart of the Coast of Chile* (1790). Courtesy Museo Naval MN-50-C-1
Conclusions

The process of creating local capabilities for the generation of knowledge in Spanish America did not commence with the arrival of European foreign geographers and naturalists in the mid-nineteenth century. As the case of the SEP’s coastal lands show, the process of producing knowledge about American space already had a long tradition that emerged during the early colonial period. From the 1750s onwards, the Spanish Crown implemented a more systematic approach to the production of knowledge about South American geography. During this period, geographical knowledge had become a crucial tool in the competition between European empires and an important instrument for the governance of overseas territories. The political upheaval of the early nineteenth century did not change this rationale, rather, it reinforced it in order to delineate the national spaces of the new republics. These new governments, as the case of Chile shows, rapidly organised expeditions and surveys to study the human and physical geographies of the newly formed states.

As a result, different surveys and compilations of geographical information and knowledge were developed between the mid-eighteenth and mid-nineteenth centuries. This led to the generation of a distinct knowledge of the geographies of the continent, which triggered a process of classification, rationalisation and territorialisation of the American space. By studying how the Chilean littoral and islands were depicted throughout this period, this chapter focused on change and continuity in the way in which geography was thought about, and in the practices and procedures used to produce geographical knowledge. In so doing, this chapter has further contributed to research that emphasises continuities over rupture from the colonial to the early national period. In this vein, the framework of the Age of the Revolutions, has allowed me to think about this period as a process of reform and modernisation of the state and its administration, instead of highlighting the ways in which Independence marked a rupture in the region’s history, as has being traditionally argued by historians (and contemporary actors). On the contrary, by bridging late colonial and early republican period, this chapter emphasised how geography was continuously thought of as an instrument for the governance of the population and for the exploitation and administration of the natural space. The work of José Perfecto de Salas in the 1750s and 60s, the role of military engineers in the late colonial period, as well as the organisation of the geographical commission conducted by Lozier and the general study of the Chilean territory led by Claude Gay in the early republican period, highlight the instrumental value of geography to the governance and territorialisation process of Chile. These
actors wrote valuable reports, drew maps, and compiled important geographical knowledge that was used by the government authorities to inform their policies and projects.

Additionally, the development of these studies shows how similar methodologies and proceedings were used to create new and updated geographical knowledge in the early years of the republic. Specific questionnaires were the main information-gathering instruments developed by Salas in his *Relaciones Geographicas*, and were later used by Lozier and Gay to gather information about the different localities across the territory. Archival work and foreign literature were also important tools used to transfer and create new geographical knowledge about the Chilean territory, particularly information related to the coastal lands and southern islands, as Salas’ *Historia Geographica e Hirographica* and Gay’s island charts show. The analysis of the work produced by the military engineers in the late 1700s and Gay’s work also highlight an important example of continuity regarding geography as a field of research. Their production of geographical knowledge was based on empirical data, emphasising their own observations and the systematic classification of the different spatial elements.

Furthermore, the study of other primary sources such as school textbooks and the press reveal the continuity of colonial geographies through the first decades of the national period in the geographical imagination of Chile, and challenges previous assumptions about Spanish American geography. In particular, the study of school geography textbooks shows the ways in which these texts continue depicting colonial images of the territory. The close examination of José Victorino Lastarria’s geography textbook has shown how the geographical knowledge and ideas about landscape produced in the late colonial period were used and transferred into the geographical imagination of the national territory. Lastarria’s broad division of the Chilean geography into islands, continent, and mountains was in a fact a reproduction of Molina’s classification and understanding of the Chilean landscape. This is significant because it highlights the importance of maritime geographies in early landscapes depictions of the country, and the continuity of colonial images into the national geographical imagination. Indeed, Lastarria’s geography textbook as well as Gay’s Atlas illustrate the different ways in which imperial Spanish geographic and cartographic knowledge was transformed into a new republican framework, nationalising what previously had been colonial imageries. Moreover, by studying Lastarria’s geographical images, this chapter has created a more nuanced analysis on the influence of European ideas on Spanish American geography during the first half of the nineteenth century, challenging previous scholarship that emphasise the sweeping impact of Humboldtian geographical images on the representation of South American landscapes.
The study of the geographical imagination of islands and coastal places enabled the analysis of historical views on nature. By addressing the role of the military engineers in the study of the coast and islands’ landscape, this chapter has stressed their role in the emergence of an instrumental view about the geographical spaces. These actors fostered a new way of thinking about the sea and littoral places, and ongoing vision of the instrumentality of the maritime landscapes. They created and promoted different projects to transform the coastal lands into profitable spaces for the prosperity of individuals or the state. Even though these projects did not have great results at this early stage, and in many cases did not yield any results whatsoever, they speak about a longue durée process of the commodification of nature. By the mid-1800s, this instrumental understanding of nature was consolidated and reinforced by the different actors that comprehended that the use, appropriation, and exploitation of these spaces was crucial for the progress and development of coastal sites, and therefore, for the nation as a whole.

Nevertheless, the changing geopolitical scenario did introduce some significant changes. Firstly, the geographical knowledge about Chile became public. Through the press and geography school textbooks the public was able to read about the different geographies that comprised the new republic of Chile. As the analysis of the press and geography textbooks illustrated, geographic knowledge was thought to be an important asset for the enlightened new citizen who needed to know the main geographical features of the country, where it was located, and its position in the world’s political geography. Thus, geographic knowledge was no longer considered solely as an instrument of governance used by the governmental elite and the military, but also became an important tool of nation building.

Secondly, the consolidation of the republican regime by the mid-nineteenth century introduced important transformations to the way in which the coastal lands were perceived in terms of the security and geographical imagination of the country. As the examination of Gay’s work has demonstrated, Chile’s islands and coastal lands lost their geo-political importance. Furthermore, these maritime places became secondary in the geographical imagination of the new republic. As recent scholarship has demonstrated, mountains and valleys acquired a more important role in the geographical imagination of the country, and in the way that the republican elites portrayed the national landscape. Building on this research, this chapter has shown the way in which maritime places were relegated to a subordinate role in the geographical imagination of the country and its cartographic depiction. This marginalisation of the islands and the littoral highlights the terrestrial-centred process of nation building in Chile. This
process emerges as the result of the consolidation of the central-valley elites (particularly Santiago’s elite) that built the nation-state, their power radiating from the centre to the peripheries. The analysis of the press further illustrates this idea. As this chapter has demonstrated, islands and coastal lands of the SEP were quickly incorporated into the geographical imagination of the new Chilean Republic. However, as the analysis of the newspapers suggests, they were frequently depicted in a negative manner. Featured regularly as remote or contested as spaces, places such the Patagonian coast and the Juan Fernández Islands were characterised as hazardous or problematic geographies. They were conceived as part of the national territory, but, at the same time, depicted as different and detached from it.

Finally, as it was addressed with respect to Gay’s research, by the mid-nineteenth century, some Chilean islands and coastal lands were beginning to be perceived as sites of global scientific interest. This marks a transition from places relevant for imperial geopolitics to sites with significant value for natural sciences. The cases of Juan Fernández and Chiloé Islands are important examples of this transition. While in the mid-1700s these maritime places were conceived crucial for the imperial rivalries and for their unique position as stepping stones for transoceanic navigation, in the 1840s the change in the political scenario as well as the incorporation of steam navigation had rendered them less important. These islands, nevertheless, were beginning to be valued for their biodiversity and unique geographical and geological features. The next chapter will address this idea more profoundly, exploring the way in which the Chilean coast was transformed into a testing ground for the transnational natural sciences. By doing so, the next chapter will widen the lens going from the local and regional knowledge productions to the global, framing Spanish American scientific knowledge about the SEP in the new political scenario after the demise of the Spanish Empire and the emergence of the new republican regimes. In particular, chapter 5 will examine how gender, formal training, and place influenced or shaped the validation of knowledge, addressing how European and Spanish American knowledge was transferred and legitimated in the last years of the Age of Revolutions.
Chapter 5: The Chilean coast as a transnational testing ground: Validation and hierarchies of knowledge at the end of the Age of Revolutions

In 1824, the British travel writer Maria Graham (1785–1842), published a report about the Chilean earthquake of 1822 in the *Transactions of the Geological Society of London*. In the document, Graham described the main features of the seismic event, recording the movement, duration and oscillation of the earthquake, as well as its effects on the terrain. After her field observations, she concluded that the land around Valparaíso bay had elevated about three feet as a consequence of the earthquake. The pieces of evidence presented by Graham triggered a transnational debate over the effects of earthquakes on the planet’s crust. While Graham’s report was used by some geologists as proof of the recent alteration to the Earth crust’s caused by earthquakes; others, simply dismissed Graham’s analysis on the alleging lack of objectivity. In 1836, the debate was reignited as the Peruvian mineralogist Mariano de Rivero y Ustariz (1798–1857) published a letter in the Chilean periodical *El Araucano* demonstrating how the 1822 earthquake did not have any effects on land-elevation on the city of Valparaíso. Gathering different testimonies from local people and making observations in the field, Rivero reached the conclusion that alleged elevation documented by Graham was caused by the accumulation of material and deposits from the houses built in the ravines. Rivero's report circulated among the European scientific community, as a translation of the published letter was read in a meeting at the Geological Society of London; however, his analysis was cast aside by the President of the society Charles Lyell (1797–1875) on the ground of not being the original document. Recently, Nicola Miller has reflected upon the importance of “thinking not only about how knowledge is produced or even how it is received but also how it acquires the necessary validation to be deemed worthy of being received”. By studying the geological reports of Graham and Rivero this chapter addresses how scientific knowledge is validated and legitimated by a knowledge community. In particular, this case raises more general questions

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751 *El Araucano*, 11 March 1836, 3.
752 Miller, “Republics of Knowledge: Interpreting,” 78.
about how gender, place, and other social factors affects the validation of knowledge during the last decades of the Age of Revolutions.

In the first half of the 1800s, the Chilean coast became an important centre of geological research. With two major earthquakes in 1822 and 1835, the Chilean littoral attracted significant attention from geologists and naturalists who were interested in studying the effects of earthquakes in the planet’s surface. Maria Graham’s report is regarded today as the first scientific account of an earthquake and its physical effects. Recent historiography has examined the 1820s and 1830s debate about the effects of earthquakes, particularly exploring the controversy between Graham and the President of the Geological Society of London, George B. Greenough (1778–1855). This research has highlighted the relevance of Graham’s contributions to geology as field of knowledge. For example, Martina Kölbl-Ebert has argued that Graham’s “account was one of the earliest detailed and geologically meaningful earthquake reports, and set a new standard for other observers”.753 In a similar vein, Carl Thompson has emphasised Graham’s agency as a science practitioner, challenging previous analysis that labelled her as a mere observer.754 Thompson has argued that Graham’s work denoted longstanding engagement with contemporary science, framing her contribution to the field of geology on the context of women’s participation in a culture of “polite science”.755 This chapter builds upon these findings, engaging in the discussion about women’s participation in science, and expanding on the way in which other factors, such as place, education and social connections, were relevant to the legitimation and social validation of knowledge. Furthermore, this chapter also poses important questions regarding the place and role of Spanish American science practitioners after the dissolution of the Spanish Empire and the emergence of Britain as a global power in the 1820s and 1830s. Drawing from recent historiography that rejects traditional diffusionists analysis about the history of science in Latin America,756 this chapter highlights the role played by Spanish American actors on the transnational scientific networks.

755 Thompson, 343.
756 Notable examples include, Cañizares-Esguerra, How to Write the History; Cowie, Conquering Nature; Nieto, Orden Natural; Schell, The Sociable Sciences; Safier, Measuring the New World; Aranda et al., “The History of Atlantic Science”; Delbourez and Nicholas Dew, Science and Empire; Bleichmar et al., eds., Science in the Spanish and Portuguese Empires; María del Pilar Blanco and Joana Page, eds., Geopolitics, Culture, and the Scientific Imaginary in Latin America (Gainesville: University Press of Florida, 2020).
It underlines, however, the increasingly unequal relationship between European and Spanish American scientists and institutions at the end of the Age of Revolutions.

The processes of institutionalisation and specialisation of science are crucial for understanding the factors that contributed to the social validation of knowledge in the 1820s and 1830s. During this period, the natural sciences — both in Europe and Spanish America — were mostly an activity pursued by amateur gentlemen and a limited number of women; however, this situation started to change by the mid-nineteenth century, when education (particularly at university level) and scientific methodologies and knowledge became more specific and specialised. Hence, amateur endeavours coexisted with those of individuals who were increasingly engaged in scientific matters as their main occupation. The emergence of the word “scientist” during the 1830s in the English language is symptomatic of the incipient professionalisation of science. According to Peter Burke, the new term “recognised the emergence of a new group, that of scholars who focused their attention on the study of the world of nature, a group that was gradually turning into a profession”. This shifting scenario is crucial to understanding how scientific knowledge was socially validated during this period.

The establishment of specialised societies and their journals became central for the legitimation of scientific knowledge. In London, for example, an array of societies were formed during the first half of the nineteenth century: The Geological Society (1807), the Astronomical Society (1820), the Zoological Society (1826), the British Association for the Advancement of Science (1831), the Entomological Society (1833), the Chemical Society (1841), and the Philological Society (1842), among others. As Burke has indicated, these societies “were, among other things, pressure groups for the establishment of disciplines”. Hence, the formation and consolidation of these scientific institutions contributed to the process of specialisation and discipline-building. These societies reinforced the idea of a community of knowledge,

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757 Schell, 83–84.
758 As Helen Cowie has established, the “word ‘científico’ did exist in eighteenth-century Spain, but it covered a broader spectrum of activities than its modern equivalent”. According to the historian, ‘ciencia’ and ‘científico’ “embraced different disciplines as philosophy and jurisprudence, activities that we would not today describe as ‘scientific’”. Cowie, Conquering Nature, 183. This explanation could also be expanded to the nineteenth-century Hispanic world. Science practitioners in Spain and Spanish America usually identified themselves as naturalists, mineralogist, or botanists. By the second half of the nineteenth-century, ‘ciencia’ and ‘científico’ acquired its contemporary meaning. See Diccionario de la Lengua Castellana. (Madrid: Imprenta de Gregorio Hernando, 1884), 241.
760 Burke, 165.
761 Burke, 164.
validating practices and methods, and, importantly, introducing a sense of belonging to a
codified group. Furthermore, as Alex Csiszar has recently argued, the scientific journals
published and endorsed by these knowledge societies need to be understood as “technologies
for ordering and managing the scholarly” productions.\textsuperscript{762} Who and what work was selected for
publication, therefore, became increasingly more specialised and subjected to greater scrutiny,
particularly in regards to whom and what subjects was being published. This meant that the
societies became active arbiters in defining what comprised their field, and what type
knowledge circulated.

This chapter is divided into five sections. Firstly, it examines the idea of the Chilean coast as a
testing ground for geological theories in the early nineteenth century. Sections two and three
explore how gender and place affected the validation of scientific knowledge production by
focusing on the cases of the reception of Maria Graham and Mariano de Rivero’s reports of the
1822 earthquake. The fourth section examines the way in which social status and connections
to scientific networks contributed to the social validation of scientific knowledge and practices.
Finally, drawing on Darwin’s early geological work, the last section argues how formal
qualifications and the increasing specialisation of those working in science came to be
perceived as crucial for the social validation of scientific knowledge.

The Chilean coast as a testing ground for geological theories

The idea of the Americas as a scientific laboratory has been already developed by historians of
science. Neil Safier introduced the idea of the Andes working as a scientific laboratory for the
French and Spanish Geodesic expedition of the mid-eighteenth century, arguing that these
mountainous landscapes acted as mobile “laboratories”, spaces where naturalists and science
practitioners could observe and experiment different natural phenomena.\textsuperscript{763} Similarly, Jorge
Cañizares-Esguerra has highlighted the way in which Alexander von Humboldt “began to think
of these mountains as a laboratory for testing theories of biodistribution”.\textsuperscript{764} Significantly,
Humboldt’s image of the American landscape as a scientific laboratory for natural knowledge

\textsuperscript{762} Alex Csiszar, \textit{The Scientific Journal. Authorship and the Politics of Knowledge in the Nineteenth Century}
(Chicago: The University of Chicago Press, 2018), 38.
\textsuperscript{763} Safier, \textit{Measuring the New World}, 13.
\textsuperscript{764} Cañizares-Esguerra, \textit{Nature, Empire and Nation}, 128.
development remained highly influential for the science practitioners that traversed the continent throughout the nineteenth century.

The explorers that travelled across Chile to study its territory included similar ideas in their publications, demonstrating that they understood the Chilean landscape as a testing ground for several fields of knowledge such as botany, geology, and minerology. Recently, Catalina Valdés, Amarí Peliowski, et al. have explored the identification of Chile as a scientific laboratory, an image particularly associated with the field of astronomy, which has been so pervasive that it still persists nowadays.\textsuperscript{765} In his analysis of nineteenth century history of science in Chile, Zenobio Saldivia has also highlighted the role of Chiloé Island as a laboratory for the study and exploration of diverse fields of knowledge such as botany and zoology.\textsuperscript{766} Likewise, the transnational debate on the effects of earthquakes on the earth’s crust that raged throughout the 1820s and 30s transformed the Chilean coastal territory into a testing ground for geological theories. The earthquakes of 19 November 1822 in central Chile and 20 February 1835 in the southern part of the country became pivotal case studies for understanding the effects of a quake on surface of the planet and their impact on land formation.

From the late eighteenth century onwards, Chile became a significant site for the study of geological processes, fossils, antiques, and minerals. The Spanish expedition conducted by the Heuland brothers (1795-1800) shows the importance attached to geological and mineralogical research in the transatlantic world in the turn of the nineteenth century. The Heulands’ expedition was the only expedition sent by the Spanish Crown solely dedicated to explore the geology of the South American territories. Commanded by the German geologists Conrad and Christian Heuland, the aim of the expedition was to gather information and knowledge about the geology and mineralogy of the colonies of the viceroyalty of Peru. The expedition was organised by José Clavijo y Fajardo (1726-1806) who, as director of the \textit{Real Gabinete de Historia Natural} [Royal Cabinet of Natural History] of Madrid, instructed the German brothers to study the physical geography of the Southern American territories. Clavijo, in particular, was interested in gathering minerals and fossils in order to improve the museum’s collection and exchange said materials with other European institutions. As can be seen in the instructions they were given, the American territories were portrayed as being a very important site for the collection of unusual fossil specimens, different minerals, and, in general, as a space that was

\textsuperscript{765} Valdés et al., “Alcances naturalistas”
\textsuperscript{766} Saldivia, \textit{La Ciencia en el Chile}, 86.
relevant for developing knowledge of geology and natural history. Furthermore, in the diary of their voyage, Christian Heuland highlighted the importance of Chile for its mineral outputs.

Both Conrad and Christian Heuland were educated at Freiberg University of Mining and Technology, specialising in mineralogy, malacology (the study of molluscs), and geology. They arrived in Spain in 1793, and were soon hired to conduct a scientific survey of the South American territories. Upon reaching the coast of Montevideo in January 1795, the expeditioners collected valuable samples of minerals and fossils. Their transit from Buenos Aires to Chile via the Andes mountains gave them the opportunity to observe and analyse the territory both in mineralogical and geological terms. In their exploration of the northern region of Copiapó, the German geologists took particular interest in the study of the earthquakes. While they were in the region, they felt an earth tremor accompanied by a very loud noise. This experience led them to inquire about this natural phenomenon. Their research focused on the movement, oscillation, and the sound that precedes the earthquake. Furthermore, the German geologists linked these superficial movements to volcanic activity and the earth’s internal processes. Unfortunately, due to the political upheaval in early nineteenth century Spain, the findings of the expedition were not published, and therefore did not circulate among the transnational scientific community. For decades the manuscripts of the German geologists remained unpublished, and the specimens brought from South America were kept in the cabinets of Spanish collections and archives, often poorly maintained and misidentified.

Malaspina’s expedition also took an interest in analysing the geology of South America’s coastal regions. Onboard naturalist Antonio Pineda (1751-1792) observed geological processes and found evidence of ancient movements of the earth’s crust on the Eastern coast of Patagonia, particularly at Cabo San Sebastián and Cabo Vírgenes. In their description of the geography of the Concepción region, José Espinosa y Tello (1763-1815) and Felipe Bauzá (1764-1834) gathered information about the earthquakes of 1730 and 1751, highlighting the effects of the tsunami on both occasions; however, their annotations in this regard were scant on detail. More interesting observations were made by the naturalist Thaddeus Haenke

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768 Barreiros, 435–36.
769 Barreiros, 464–65.
770 AHN, Fondo Francisco Vidal Gormaz, Vol. 1., Pieza 1, fjs. 54-55.
771 Sagredo and González, La Expedición de Malaspina, 385–86.
(1761-1816) in his analysis about land-formation in the Andean region, near Santiago. According to the naturalist, the particular form of this landscape was the result of earthquakes, volcanic activity or some other violent cause.\textsuperscript{772} For Haenke, the Andes offered a unique scenario for observing and describing geological processes, particularly land formation. These mountains allowed him to see what he called the “great book of Nature”, a perfect setting for studying the landscape, orography, and hydrography of the region.\textsuperscript{773}

The independence of Spain’s South American colonies opened up their territories for greater scientific exploration. From the early 1820s onwards, the continent was explored, surveyed and catalogued by different expeditions that studied the region’s botany, zoology, climate, mineralogy, geography, hydrography, and the fossils and antiquities to be found in these territories. In particular, Chile was valued as an interesting place for research for its relatively unknown natural features.\textsuperscript{774} As previous historiographical research has highlighted, the study of the natural world received an important boost in the early years of Chile’s republican life.\textsuperscript{775} Explorers and naturalists such as Eduard Poeppig, Charles Darwin, Claude Gay, and Rudolph Philippi studied the country’s natural history with the blessing of the Chilean administration. In the cases of Gay and Philippi their expeditions were even financed by the Chilean government. Research on earth sciences increased greatly by the mid-nineteenth century, as Chile was thought to be home to considerable mineral wealth. The role of the Pole Ignacy Domeyko (1802-1889) was crucial in the mineralogical and geological research that was ongoing in the Chilean territory.\textsuperscript{776} While mineralogical observations and research were deemed to be more important than geological studies due to their economic advantages, constant seismic activity made Chile the most important site for the study of earthquakes and their effects on the earth’s crust in the nineteenth century. This continuous and intense activity transformed Chile’s territory into a testing ground for different geological theories about land formation.

Maria Graham’s description of the effects of the 1822 earthquake opened the landscape up to geological research. The frequency and intensity of the seismic activity in Chile’s coastal

\textsuperscript{772} Thaddaeus Haenke, \textit{Descripción Del Reyno de Chile} (Santiago de Chile: Nascimento, 1942), 116.
\textsuperscript{773} Haenke, 116–17.
territory made it the ideal site for testing and analysing the effects of earthquakes. As Graham acknowledged in her published travel journal: “It seemed as if we were admitted to the secrets of nature’s laboratory”. Previous earthquakes had given naturalists the opportunity to observe and study this natural phenomenon and its effects. The 1755 Lisbon earthquake, widely regarded as the most important seismic event in European history, has “often been marked as the catalyst for a modernizing shift in scientific, philosophical, and theological thinking” about earthquakes and their geological consequences. Subsequent events, such as the 1783 earthquake in Italy and the 1812 earthquake in Venezuela, allowed naturalists to study different aspects of this geological phenomenon, namely duration of the tremor, the aftershocks and the area affected by the earthquake. In Italy some observers also reported the effects of the event on the earth’s surface. However, these events in Europe and South America were no near as intense as the Chilean earthquakes; therefore, their effects in the terrain were less clear. The magnitude and intensity of the 1820s and 1830s earthquakes in Chile allowed naturalists and amateur science practitioners to record and study these phenomena, permitting them to measure their duration, register their movement and oscillation, as well as to record the effects on the earth’s surface. Hence, Chile, particularly its coastal lands, played an important role in the production of global geological knowledge.

As will be discussed in this chapter, Graham’s observations and conclusions regarding the 1822 earthquake generated great controversy and attracted the attention of science practitioners interested in geology to the SEP’s coastal lands. Indeed, during the 1820s and 1830s, Chile’s coastal region became a geological testing ground, naturally equipped for examining the effects of earthquakes and for building knowledge about the planet’s geological processes. According to Alain Corbin, since the mid-eighteenth century, shores had become a “laboratory” for different practices of geological observations. Naturalists and amateurs travelled to the beach to study “the Earth’s past and the origins of life”. In the second half of the 1830s, the publication of Fitz Roy and Darwin’s accounts of the 1835 Concepción earthquake further attested the importance of Chile as a testing ground for Earth sciences, showcasing Chile’s recent geological processes before a global readership. Their voyage across South America,

777 Maria Graham, Journal of a Residence in Chile during the year 1822 and a Voyage from Chile to Brazil in 1823 (London: Longman, Hurst, Rees, Orme, Brown and Greene and John Murray, 1824), 329.
780 Corbin, The Lure of the Sea, 97.
781 Corbin, 97.
especially through Chile and Patagonia, allowed Darwin to reflect on the historical geology of the planet and its modern alterations, as David Norman has explained.782 Furthermore, his experience as a witness of the 1835 seismic event allowed him to corroborate in situ geological theories about land formation and land elevation.

At the end of the Age of Revolutions, the coastal lands of the SEP were no longer valued solely on their geostrategic position in the transoceanic navigation, but also because of their scientific instrumentality and unique natural features. By the 1840s, the image of Chile as an interesting geological site and testing ground for the Earth Sciences had been consolidated. In 1842, for example, W. Miller wrote in the Journal of the Royal Geographical Society of London that “Chili is to a mineralogist or geologist one of the most interesting countries in the world”.783 The British publication argued that the whole country provided evidences of recent changes to the Earth’s crust caused by seismic activity, stressing at the same time how all of this could be lost “unless scientific persons are present to observe and compare the extraordinary effects of these convulsions of the earth”.784 However, as the following sections will examine, who exactly qualified and was accepted as a ‘scientific person’ in the later period of the Age of Revolutions was a contested matter.

The gendered dimension of knowledge validation

In the early nineteenth century, women’s publications in scientific journals were uncommon. Yet, as previously mentioned, Graham’s article “An account of some effects of the late Earthquakes in Chili” was published in the 1824 volume of the Transactions of the Geological Society of London. The article described the 1822 Valparaíso’s earthquake and its effects on the terrain. By doing so, Graham became the first woman to be published in this scientific journal. However, Graham’s published work represents an anomaly. In the first half of the nineteenth century, women’s participation in geology was largely restricted to the amateur activities of observation, collection, and classification, as Creese and Creese have

784 Miller, 137.
demonstrated.\textsuperscript{785} The processes of professionalisation and the specialisation of science throughout the nineteenth century contributed to their marginalisation. Indeed, the emergence of knowledge societies such as the Geological Society and the Royal Geographical Society in the nineteenth century marked a turning point in the practices of the earth sciences and natural history, transforming them into predominately masculine activities. The reception of Maria Graham’s report by the geological community represents a key example of the changes taking place in relation to the role of women in scientific production. This section explores the ways in which gender played a central role in the validation of scientific knowledge, by analysing the dispute between Maria Graham with the President of the Geological Society of London, George Greenough

Graham’s credentials as a science practitioner have previously been examined in detail. Martina Köbl-Ebert has portrayed her as a lay person, a scrupulous eyewitness of the Chilean earthquake, but one who was unaware of the key debates in the Earth sciences.\textsuperscript{786} Thompson, on the other hand, has argued that Graham was informed about contemporary geological discussions, comparing her report with Horace Benedict’s geology handbook.\textsuperscript{787} Graham, as a woman from a wealthy family, was educated in several fields ranging from Latin, French and Italian, to botany, history, geography, and drawing.\textsuperscript{788} In one unpublished memoir, she declared her fascination and great interest with natural history and botany.\textsuperscript{789} According to Thompson, Graham’s interest in science remained active throughout her entire life, but her knowledge of scientific debates and practices was only revealed in her private papers, rather than in her published work.\textsuperscript{790} Her correspondence with the botanist Robert Brown (1773–1858), and Mary Somerville (1780–1872), the Scottish polymath, attest to her connections with renowned scientific figures of the period. This suggests that Maria Graham was an educated scientific amateur, with relevant connections, who engaged with contemporary scientific debates, practices, and practitioners.

\textsuperscript{785} This would only change by the turn of the twentieth century as women became to be formally trained in geology. See, Mary Creese and Thomas Creese, “British Women who contributed to research in the Geological Sciences in the Nineteenth Century,” \textit{Proceedings of the Geologists’ Association} 117, no. 1 (2006): 53–83.
\textsuperscript{786} See Köbl-Ebert, “Observing Orogeny”
\textsuperscript{789} Thompson, “Earthquakes and Petticoats,” 339.
\textsuperscript{790} Thompson, 339–40.
As has been recognised by Stefanie Gänger, until the end of nineteenth century, most naturalists – not just of Spanish America but the world – were amateurs.\textsuperscript{791} Collecting, recording, and cataloguing techniques were easy to learn, and scientific instruments were fairly cheap; the mere act of observe and describe opened up several fields of the natural sciences to the participation of learned people, as Gänger has explained.\textsuperscript{792} However, with the increasing specialisation of scientific knowledge production, the participation of amateurs became more restricted, particularly impacting women’s engagement in science. As Michelle Medeiros and Dea Birkett have argued, “women were only allowed to participate in non-scientific and amateur pursuits”, stressing the way in which women were marginalised and restricted as an area of study became established as a science.\textsuperscript{793} Moreover, if a woman was involved in scientific endeavours, this activity would be labelled as amateur or not considered scientific at all.\textsuperscript{794} Nevertheless, learned and curious women, such as Maria Graham, developed strategies that allowed them to overcome the barriers posed by their gender, status, and lack of specialised education at university level. Moreover, following Mary Louise Pratt’s ideas, Medeiros has shown that travel writing in contact zones allowed women to explore and carry out their scientific research, as the limitations of their gender were blurred by their status as Europeans, making acceptable to them to produce scientific knowledge.\textsuperscript{795} Chile, then, gave Graham the opportunity to explore, examine, and describe natural phenomena that had hitherto been little studied, in a place scarcely known to global scientific networks.

In spite of being an amateur, Maria Graham’s article ‘An account of some effects of the late Earthquakes in Chili’, was published in the prestigious Transactions of the Geological Society of London in 1824. Graham’s earthquake report and analysis was composed as a letter to Henry Warburton, one of the most influential members of the Geological Society. According to Thompson, this was a common discursive strategy for women in the early nineteenth century, who often sought the sponsorship of a male mentor when venturing publicly into the masculine arena of scientific debate.\textsuperscript{796} Graham’s report described with accuracy the date, timing, duration, direction of movement and the area affected by the earthquake of 19 November 1822

\textsuperscript{791} Gänger, “Colecciones y estudios,” 82.
\textsuperscript{792} Gänger, 82.
\textsuperscript{794} Medeiros, 275.
\textsuperscript{795} Mary L. Pratt, Imperial Eyes: Travel Writing and Transculturation (New York: Routledge, 2007); Medeiros, “Crossing Boundaries,” 266, 280.
\textsuperscript{796} Thompson, “Earthquakes and Petticoats,” 332.
in central Chile. It also featured the intensity and periodicity of the aftershocks, as well as the weather on the days that followed.\textsuperscript{797} Lastly, she described the tsunami at Valparaíso Bay and the effects of the earthquake on the terrain.

Graham’s account of the geological event in Chile was unique. While her report to the Geological Society of London focused on observable data and the effects caused by the earthquake, local accounts of the event fixed their attention on the causes. For example, the periodical \textit{El Mercurio de Chile} explained that the interior fermentation of the fuels of the Earth was responsible for the movement of the surface.\textsuperscript{798} According to Gabriel Cid, the intellectual debate in Chile was divided into two camps; intellectuals who attributed the catastrophe to natural phenomena, and a second group who argued that the event was caused by supernatural forces.\textsuperscript{799} During the Age of Revolutions, as secularisation of Atlantic societies gained pace, providential explanations coexisted with rational explanations about the causes of earthquakes, as Quinn P. Dauer has explained.\textsuperscript{800} In this context, Chilean scientific accounts on seismic activity did not consider it relevant to focus on the effects of the earthquake on the local landscape, rather, they focused on pinpointing its origins.\textsuperscript{801}

One of the most important features of Graham’s publication was her emphasis on changes in elevation as a consequence of the seismic activity. She wrote that “it appeared on the morning of the 20\textsuperscript{th} that the whole line of the coast from north to south, to the distance of above 100 miles, had been raised above its former level”.\textsuperscript{802} Graham explained that the alteration in Valparaíso was about three feet, while in Quintero land was elevated by about four feet. To support this, she presented three main pieces of evidence. Firstly, prior to the earthquake there was an old wreck of a ship at Quintero Bay which had not previously been accessible, but after the event it became accessible. Secondly, new rocks emerged at Valparaíso from which the local fishermen collected shellfish. Thirdly, an ancient bed of shells was discovered in Quintero

\textsuperscript{797} Graham, “XXV. — An Account of some effects,” 413–14.
\textsuperscript{798} \textit{El Mercurio de Chile}, de diciembre de 1822, 319.
\textsuperscript{801} Other accounts, such as administrative reports, and the press, did focus on social effects and material damage produced by the seismic activity. For the case of the 1822 earthquake, see “Terremoto del 19 de noviembre de 1822. Informe dirigido al señor Brigadier y Gobernador de la Plaza de Valparaíso, don José Ignacio Zenteno, por don Carlos Thurn”. 1919, en Revista Chilena de Historia y Geografía, N° 31, Santiago, pp. 189-193, cited in Cid, “¿Fenómeno natural?”, 54. For the 1835 earthquake see \textit{El Aracuano}, 27 February and 6 March 1835.
\textsuperscript{802} Graham, “XXV. — An Account of Some effects...” 415.
Bay,\textsuperscript{803} which led her to conclude that “the coast had been raised by earthquakes at former periods in a similar manner”.\textsuperscript{804} These effects were described using a scientific language and relying on verifiable observations; however, these observations would become highly contested.

At first, the impact of Graham’s report was minimal, but everything changed when Charles Lyell (1797–1875), one of the most influential geologists of the period, employed Graham’s account, along other cases, as the empirical basis upon which to prove his theory about how earthquakes cause changes to the earth’s crust.\textsuperscript{805} Lyell subscribed to the theory of ‘Vulcanism’, which maintained that “mountain ranges were the result of a vertical elevation caused by igneous activity”.\textsuperscript{806} The events at Valparaíso in 1822 provided him with the new and modern pieces of evidence needed to support his Vulcanists ideas.\textsuperscript{807} Lyell not only used Graham’s observations to promote his own theories, but more importantly, he supported her conclusions regarding the lasting effects of earthquakes on the physical features of the coastal landscape. However, as Creese and Creese have argued, “the idea of massive uplift of major blocks of land as the result of seismic activity was far from universally accepted then or for some time afterwards”.\textsuperscript{808} In the mid-1830s Graham’s observations were challenged by George Greenough co-founder and first President of the Geological Society of London.

George Greenough was a geologist, educated at Pembroke College, Cambridge, and at the University of Göttingen. Unlike Lyell, Greenough ascribed to the theory of Neptunism, which argued that the planet’s landforms were the product of ancient hydraulic processes.\textsuperscript{809} As President of the Geological Society of London (1833-1835), Greenough used his position of power to discuss subjects that were of particular interest to him. On the anniversary meeting, in 1835, he addressed the issue that was most exciting to geologists at the time: the theory of

\begin{footnotesize}
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\item \textsuperscript{803} Graham, 415.
\item \textsuperscript{804} Graham, 415.
\item \textsuperscript{805} Lyell used the earthquakes of Valparaíso (1822), Murcia (1829), Bogotá (1827), Caracas (1812) among other cases to demonstrate the modern alterations to the planet’s crust. See Charles Lyell, \textit{Principles of Geology: Being an Inquiry How Far the Former Changes of the Earth’s Surface Are Referable to Causes Now in Operation}, 4\textsuperscript{th} ed., vol. II (London: John Murray, 1835), chapter XIV.
\item \textsuperscript{806} Kölbl-Ebert, “Observing Orogeny,” 37.
\item \textsuperscript{807} Lyell argued: “when the district of Valparaíso was examined on the morning after the shock, it was found that the whole line of coast, for the distance of above one hundred miles, was raised above its former level”. Lyell, 231.
\item \textsuperscript{808} Creese and Creese, "British Women," 65.
\item \textsuperscript{809} Kölbl-Ebert, “Observing Orogeny,” 38.
\end{itemize}
\end{footnotesize}
land-elevation. First, Greenough briefly examined Von Hoff’s analysis of Java’s earthquake, but his critique focused on Maria Graham’s report, arguing that the alleged evidence of the elevation on the coast of Chile required further examination. As Kölbl-Ebert has suggested, Greenough’s attack on Graham was made because of the increasing use by Lyell and others vulcanists geologist of her evidence “as a key argument in their theory of mountain building”. As a mere observer and a woman at that, he perceived Maria Graham as an easier adversary than the eminent figures of Lyell and Van Hoff.

Greenough subjected Graham’s report to the most rigorous examination, questioning not only the results of her research, but also her methodologies and scientific credentials. In his address to the Society, the geologist employed several strategies to diminish Graham’s scientific validity. Initially, Greenough addressed the accuracy of the measurements made by Graham and the use of proper scientific instruments. For example, Greenough questioned: “How could a range of country so extensive be surveyed while the ground was still rocking, which it continued to do on that day, and for several successive months? What was the average number of observations per square mile? Who made, checked, and registered them?”. These claims were combined with moral accusations: “who on the morrow of so fearful a catastrophe could command sufficient leisure and calmness to determine and compute a series of changes, which extended 100 miles in length”. Greenough’s argument played with two antagonistic ideas. In order to invalidate her findings, he questioned Graham’s objectivity as a valid observer, while also judging her subjectivity.

Another tactic used by Greenough to discredit Graham’s report was to imply that the causes of the events that she detailed laid in other phenomena that were external to the earthquake itself. For example, he pointed out that the fish mentioned by Graham probably lay dead on the shores because “there had been a storm”. Neither Graham nor any other observer of the earthquake had mentioned a storm, let alone in November, which is a dry season month. This is significant because it shows that Greenough was willing to create new information just to undermine Graham’s credibility. Moreover, the geologist argued that Graham’s conjectures did not have

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811 Greenough, 56.
813 Greenough, “Address Delivered at the Anniversary,” 56.
814 Greenough, 56.
815 Greenough, 57.
any historical grounding. By the 1800s, geology relayed heavily on historical accounts, along with the study of physical laws and chemical analysis, as one of the most important ways of validating new knowledge.\textsuperscript{816} In this vein, Greenough attached weight to the fact that the elevation of the land as a consequence of an earthquake had not been identified by the well-known work of the Chilean naturalist Juan Ignacio Molina (1740-1829), the most important authority in the field of natural history of Chile.\textsuperscript{817} To Greenough it was worth mentioning that neither Molina nor any other Spanish or Spanish American author had said anything about land elevation after an earthquake.\textsuperscript{818} It is significant that Greenough was prepared to quote these colonial accounts in order to discredit Graham’s contemporary observations, instrumentalising historical reports that barely even discussed the physical effects of earthquakes. Furthermore, he emphasised the fact that none of her male British contemporaries, such the Captain of the *Beagle*, Philip Parker King, were able to attest to these changes on the Chilean coast.\textsuperscript{819} As he remarked, they “saw no traces of such an event, and the natives with whom they conversed, neither recollected nor could be induced to believe it”\textsuperscript{820} In Greenough’s discourse, these men’s casual impressions had far more credibility than the rigorous notes and observations taken by Maria Graham in the field.

Lastly, Greenough questioned the legitimacy and accuracy of Graham’s report by quoting local accounts of the effects of the earthquake. Greenough referred to the article published in the journal *La Abeja Argentina*, which was introduced to Greenough by Woodbine Parish (1796–1882), the appointed British commissioner and consul-general to Buenos Aires, and an active contributor to the Geological Society of London.\textsuperscript{821} *La abeja Argentina* was described by Greenough as a “work of considerable reputation”,\textsuperscript{822} and the paper itself was regarded as “a sensible straight-forward description of what actually took place, without the high colouring in which ignorance and terror and exaggeration are apt to indulge”\textsuperscript{823} This is interesting because it offers a comparison with Graham’s report, perceived by him as an inaccurate and subjective account. Therefore, not only was the content of Graham’s report questioned by Greenough, but

\textsuperscript{817} Molina wrote *Saggio sulla storia naturale de Chili* (1792).
\textsuperscript{818} Greenough, “Address Delivered at the Anniversary,” 57.
\textsuperscript{819} Greenough, 57.
\textsuperscript{820} Greenough, 57.
\textsuperscript{822} Greenough, “Address Delivered at the Anniversary,” 57–58.
\textsuperscript{823} Greenough, 58.
also her methodologies, her objectivity, and status as a valid observer. Finally, by quoting the published testimony of Don Onofri (Humphrey) Bunster (1785-1869), a British navy man and permanent resident of Valparaíso, Greenough suggested that the uplift on the coast was an unlikely phenomenon, thus implying that Graham’s observations were not real.

An extract of Greenough’s critique of Graham’s report was published in the British journal *The Athenaeum* on 14 June 1834. The circulation of this issue brought more attention to the debate of the effects of earthquakes on the Earth’s crust. In response, Maria Graham “arranged the publication of a pamphlet that brought together her 1824 report, Greenough’s comments, and a letter counterattacking Greenough’s critiques” 824 Simultaneously, she tried to get her rebuttal letter to publication in the same journal that had published Greenough’s comments, *The Athenaeum*, but the journal refused to publish it, on the grounds that it was of “merely personal interest”. 825 The refusal of the journal to publish her letter prevented Graham from publicly defending and legitimating her scientific work. Moreover, this action reveals the marginalised position of Maria Graham as a woman and amateur scientist in comparison with George Greenough, an authority figure in the geological community, who used these channels to reinforce and validate his scientific work and agenda. Nevertheless, *The American Journal of Science and Arts* regarded the discussion as relevant for scientific progress of geology, publishing the whole affair in 1835: Graham’s first report, Greenough’s attack, and her letter in response. 826

The strategies used by Graham, by then married as Maria Callcott, in her response letter are eloquent examples of the way in which scientific arguments were constructed in the first half of the nineteenth century. Graham validated her report on the basis of the accuracy of her field observations, the thoroughness of her records, and the accurate use of her scientific instruments to measure the natural phenomena. 827 As Daston and Galison have indicated, “let nature speak for itself” became the watchword of the new scientific objectivity by mid-nineteenth century. 828 Graham created a narrative that instrumentalised the idea of scientific objectivity in order to reinforce her claims. She also validated her observations by declaring her alleged ignorance about geology. In her published response letter, she stated that her indifference to all geological

827 Graham, 246–47.
theories rendered her testimony unbiased, and therefore, all the more valuable. With this strategy, Graham turned her observations into data to be used by other (expert) people. For Thompson, her “admission – or more accurately, pretence – of geological ignorance was a deft rhetorical manoeuvre” that allowed her to hint that Greenough was following a theoretical agenda, while she appeared as a neutral observer. Following Medeiros, this strategy can also be understood as a “feminised form of scientific discourse”, that permitted her the opportunity to “pursue her scientific endeavours without fearing retaliation from the then exclusively male scientific community”. Graham constructed an argument based on the rhetoric of objectivity by emphasising her neutrality and accuracy of her observations and records.

As part of her objectivity discourse, Graham dismissed local testimonies on the grounds of religious superstition, marginalising these accounts and experiences. Likewise, she discredited the alleged local expert voices quoted by Greenough, who, as she asserted, were not located on the coast, and therefore their testimonies could not be considered valid. Additionally, Graham highlighted the errors and fabrications upon which Greenough’s account was based. For example, she pointed out that there was not a storm at that time, and that there was no naval officer either with whom to compare her observations. Furthermore, she stated that Greenough’s account deliberately suppressed information. Finally, Maria Graham denied each accusation made by the president of the Geological Society, reinforcing the legitimacy of her observations by positioning herself in the site of the events.

In order to support his theory and dismiss Graham’s claims, George Greenough searched for new testimonies to settle the discussion surrounding the effects of the 1822 earthquake on the Chilean coast. At the meeting of 2 December 1835, three letters written by male authors were read aloud. The first one was written by Captain Edward Belcher to the aforementioned Woodbine Parish. The letter argued there were no evidence of changes in Valparaíso Bay after the natural event. The second letter was written by Lieutenant Bower on 7 March 1835. In spite of not having experienced the earthquake, Bower reinforced the idea that there were no clear changes on the shores of the bay after the seismic activity. Moreover, the navy officer

830 Thompson, “Earthquakes and Petticoats,” 344.
833 Graham, 244–45.
834 Graham, 244.
835 Graham, 243.
indicated “that since the earthquake, the water has gradually receded”, directly contradicting the data presented by Maria Graham.

The third letter, dated 5 March 1835, written by Hugh Cuming, was the most compelling. Cuming (1791-1865) was an Englishman who resided in Valparaíso, and a conchologist who specialised in the collection of mollusc shells. His use of proper scientific language, his fieldwork experience, his background as an amateur naturalist and shell collector, and his expertise on the coastal geography of Valparaíso, were highlighted by Greenough as proof of the validity of his testimony. Cuming’s letter must be read as a direct attack on Maria Graham’s report. Not only did he discredit her conclusions, but he refuted her evidence as well. On the morning after the earthquake “he noticed the effects, but found nothing more than a high tide”, adding that “he never heard of the rocks having been heaved up, or the permanent retirement of the sea, until the publication of Mrs. Graham’s work, to the statements contained in which neither he or his friends could subscribe”. Moreover, Cuming concluded his letter adhering to Greenough’s theory, arguing that the changes in the relative levels land and sea levels were due to “the accumulation of detritus”. Cuming was perceived by Greenough as a particularly valid figure to challenge Graham’s observations since he was at once a man, an amateur naturalist and an expert on the local geography.

Overall, the Graham/Greenough debate highlights the gender dimension of the process of construction and the validation of scientific knowledge. Graham deployed all the means at her disposal as an amateur woman, supporting her claims via the objectivity of her observations. Greenough, in contrast, used all the tools available to a man of his position and authority, promoting his ideas through the Geological Society of London. In the midst of this debate, a new earthquake struck the Chilean territory in February 1835. This event offered a new opportunity to study the effects of earthquakes in planet’s surface with greater detail.

As previously stated, the mineralogist Mariano de Rivero, published a letter that discussed the geological effects of the 1822 earthquake in Valparaíso. Instead of examining the latest earthquake of February 1835, Rivero chose to analyse the case of the 1822 earthquake. By doing so, Rivero avoided engaging with the observations made by the British Captain Robert Fitz Roy (1805-1865), and the British traveller and amateur naturalist Alexander Caldecleugh

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837 “Meeting December,” 213.
838 “Meeting December,” 213.
839 “Meeting December,” 213.
840 “Meeting December,” 214.
(1795-1858), who indicated that the land of the coastal region of Concepción presented an increased elevation as the result of the latest seismic activity. Furthermore, Rivero pointed out that his expertise was in the study of Valparaíso’s bay, and therefore, he could only attest to changes in the geological structure of this region. Rivero constructed his analysis as a critique of Maria Graham’s report, basing his analysis on the premise of the falsehood of Graham’s observations. While he featured himself as a man of science, Rivero labelled Graham as a lay person, who just experienced the 1822 earthquake, undermining the validity of her report.

Rivero, as a man of science, used his expertise to dismiss Graham’s arguments, building his legitimacy on scientific language and the objectivity brought about by the use of scientific instruments, utilising this strategy to subvert Graham’s credibility as a lay person. Rivero used two main strategies to discredit Graham’s account. Firstly, he described the proof presented by the British traveller, namely the shipwreck and the ancient bed of shells found at Quintero Bay, adding new arguments of his own to her findings. Rivero argued that the British traveller had presented the elevation of a mill in Concón Bay as proof of the increased elevation; however, this was never mentioned by Graham in her report. Secondly, he conducted his own research in the field, taking measurements in different parts of Valparaíso. The results led him to conclude that there was no evidence for supporting the uplifting of land on Valparaíso. On the contrary, he argued that the alleged elevation was confused with the accumulation of material of the nearby rivers and ravines. Rivero’s published letter about the 1822 earthquake’s effects circulated transnationally. Nevertheless, his observations were not published in foreign journals. This particular episode of the controversy over the effects of the 1822 earthquake on the Chilean coastal land enables the examination the role of place in the circulation and social validation of scientific knowledge.

The role of place in knowledge validation

A translation of Rivero’s article was read out at a meeting of the Geological Society of London in 4 January 1837. The document was accompanied by a letter written by Colonel John Walpole (1787-1859), the British Consul-General in Chile, who strongly supported his conclusions. However, the details of Rivero’s report were not published in the Proceedings of the Geological

841 El Araucano, 11 March 1836, 3.
842 Rivero also support his fieldwork with the testimonies of sailors and ancient local fishermen. El Araucano, 11 March 1836, 3.
Society. This episode is worth dwelling upon. Why exactly was Rivero’s paper, an important continuation of the earthquake debate, not published in the Society’s journal? This section analyses the relevance of place in the legitimation of scientific knowledge. By discussing the reception of European and Spanish American accounts of the effects of the 1822 earthquake, I will argue that the place where knowledge is produced plays an important role in its validation by the scientific community.

First, it is important to address why the London Geological Society did not publish Rivero’s article. According to the scientific institution, Rivero’s article could not be published because it was a translation, and not the original document. The suppression of the Peruvian mineralogist’s article in the British scientific journal is significant: it shows inequality in the relationship between European and Spanish American naturalists, highlighting the role of power relations in the validation of knowledge. This event in particular depicts the increasing marginalisation of Spanish as a scholarly language by northern European countries (Britain, Germany, France) in the last period of the Age of Revolutions. After the dissolution of the Spanish Empire, Spanish had lost even more power and presence among the scientific community. In this new scenario, Spanish American scholars had to publish and communicate their research in other languages, mainly English, French, or German, in order to be accepted, validated or even read. Second, it is worth noting that Rivero’s account directly challenged the position of the incumbent president of the society, Charles Lyell, the most prominent Vulcanist of the period. For Lyell, it was convenient not to publish Rivero’s report and disseminate his results, which would have fuelled another round of the Graham/Greenough controversy. Instead, the Society’s Proceedings published Charles Darwin’s paper entitled “Observations of proofs of recent elevation on the coast of Chili (...),” which presented new pieces of evidence that backed up Vulcanists theories. By publishing this account, Lyell wanted to close the discussion on the recent changes in elevation on the Chilean coast, presenting the document as the ultimate proof of recent alterations to the earth’s surface. In this vein, it is also worth pointing out the strategy used by Lyell to present this new report. While he emphasised that Darwin was an authority in geology, highlighting his fieldwork experience and his ties with the British geological community, Lyell omitted all Rivero’s credentials when he read his

844 See “January 4, 1837, Proceedings,” 446.
report to the rest of the members of the society. This was meant to discredit the observations made by the Peruvian science practitioner, while supporting Darwin’s claims.847

But who was Rivero? Knowledge about his background is key for understanding his engagement in this debate and why was important for Lyell to omit his conclusions. Born in Arequipa in 1798, he was sent to study to England at a young age. He later moved to Paris to study at the École Polytechnique and the École des Mines, where he specialised in mineralogy and chemistry.848 Here, Rivero was introduced to the European scientific community. Particularly important was his friendship with Alexander von Humboldt (1769-1859), who took him under his wing and promoted Rivero’s work among his own extensive European and Latin American networks. In 1822, he returned to South America to start his research in mineralogy in Venezuela and later in Peru, where he worked to found a variety of scientific institutions, such as the National Museum of Natural History and Antiquities, the School of Mines, and co-founded the natural science journal Memorial de Ciencias Naturales y de industria nacional y extranjera [Memorial of the natural sciences and of national and international industry].849 The political upheavals of the late 1820s in Peru forced him to migrate to Chile where he continued his scientific endeavours. The periodical El Araucano published his letter to the French naturalist and geologist Alexandre Brongniart (1770-1847), which described the geological structure of the Valparaíso region. As a corollary, the letter argued that the orogeny (the process of mountain formation) of Chile was a phenomenon that was “only explained by the Neptunians theory”.850 Brongniart was a prominent Neptunian who defended the idea of land formation as the result of past catastrophic events. Rivero’s observations in Valparaíso region helped to gather more evidence to support this theory. According to the Peruvian mineralogist, the idea of igneous activity causing the uplifting of land had no support, emphasising that there were no traces of volcanic eruptions in the area. Furthermore, his observations and fieldwork on the region of Valparaíso motivated him to participate in the transnational debate of the effects of the 1822 earthquake, publishing his conclusions in the Chilean state-funded periodical El Araucano in 1836. His observations and in-situ analysis in Valparaíso, then, contradicted the President of the Geological Society, Charles Lyell, ideas about land formation.

848 José Domingo Cortés, Diccionario Biográfico Americano, Segunda (Paris: Tipografía Lahure, 1876), 423.
849 Cortés, 424.
850 El Araucano, March 4, 1836, 1.
Neptunians’ ideas about land formation circulated in post-Independence Chile. In 1829 *El Mercurio Chileno* published an article that addressed the latest discoveries of fossil sea shells at altitude in the Pyrenees as evidence of how oceans were one of the major agents in shaping the planet’s crust. ⁸⁵¹ The column concluded that it was more likely that water had in the past shaped land elevation, as it mentioned ways in which the oceans may have recoiled. The circulation of these theories also coincides with the fact that the majority of South America-based scientists and science practitioners, such as Rivero and later on Rodulfo Philippi (1808-1904) Chile’s National Museum Director, who favoured this theory to explain the planet’s diverse land formations. Hence, Rivero’s perspective on the effects of earthquakes on land formation was far from been unique; he was supported by a numerous community in both Europe and the Americas.

The French naturalist based in Chile, Claude Gay, also examined the effects of the 1835 seismic event. Gay focused his attention on the effects of the tsunami in the Concepción region and on assessing the elevation of the coastal lands after the earthquake. Quoting Fitz Roy’s report, Gay pointed out that the land of Santa María island was elevated; however, after analysing the shores of the region, he stated that there were no signs of elevation at other coastal sites. ⁸⁵² With this statement, Gay did not want to contradict the results of the British expedition; nevertheless, it shows that he was not totally convinced that all of the alleged changes were produced by the earthquake. According to the naturalist, further analysis should be developed in other places of the Biobío region in order to fully determine the effects of the seismic event on land elevation.

British and Chile-based naturalists, such as Rivero and Gay, were not the only science practitioners that examined the effects of the earthquakes of 1822 and 1835. On the contrary, the debate on the effects of the Chilean earthquakes became a transnational affair, reaching the United States. *The American Journal of Science and Art* paid particular attention to the issue, featuring two letters supporting Graham’s observations. The first was a printed letter written by I. Robinson, which described the physical and social effects of an earthquake, dated 15 December 1822, and, a second was written by Captain Robert Joy, dated 23 September 1835. This was written to be published as a response to Greenough’s address to the Geological Society of London on the effects of the 1822 earthquake. Joy’s letter emphasised the elevation of the land as a consequence of the geological event, arguing how this was most visible on the

⁸⁵¹ *El Mercurio Chileno*, 15 April 1829, 627.
⁸⁵² AHN, Fondo Claudio Gay, Vol. 17.- Pieza 27, fs. 97-98
rocky parts of the bay were the land was elevated “from two to six feet above the usual tidewater mark”. Joy’s letter provided new evidence of the uplift of Valparaíso’s coast, focusing particularly on the changes to the depth of the bay. By publishing these letters, it became evident not only that the editor of the American publication supported Graham’s observations, but, more importantly, that the journal was committed to supporting the theory of the gradual elevation of land caused by seismic activity, stating that the rising of the Chilean coast was “fully established” matter.

Also relevant to the argument of the importance of place in the legitimation of scientific knowledge was the role played the British Foreign Quarterly Review. After the earthquake of 1835 in Concepción, the publication actively engaged in the debate about the role of earthquakes in the elevation of landmasses. The periodical quoted the reports of Alexander Caldecleugh to the Geological Society and Robert Fitz Roy’s account to the Geographical Society in London. With these testimonies, the elevation of Concepción bay and Santa María island were stated as fact, while the effects of the earthquake of 1822 in Valparaíso still generated doubts. The journal highlighted the necessity of finding new statements to confirm or deny the changes. It is worth noting that the journal specifically addressed the necessity of finding statements from foreign travellers, which ultimately emphasises the authority and legitimacy of foreign (European) accounts and, in turn, shows the discredit of local Spanish American observations and analysis:

> So much importance has been attached to the question of the effect of earthquakes, as having occasionally produced an elevation of the coast of Chili, and so much, at times too acrimonious, controversy has arisen on the subject, that we have been induced carefully to look into the works of foreign travellers, in order to discover any statements tending to confirm or refute the theory.

In order to complete this task, the journal published two accounts of German naturalists who travelled to Chile in the 1820s and 1830s. First, the periodical published a lengthy examination of Franz Meyen’s account of his voyage to South America. In his travel account, Meyen

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854 Silliman, 113.
855 Silliman, 113.
857 The book was titled “Reise um die Erde, ausgefuhrt auf dem Koniglich Preussichen Seehandlungs-Schiffe, Prinzess-Louise, commandirt von Capitain W. Wendt, in den Jahren 1830, 1831, 1832”, and translated into English as “Voyage round the world in the Prussian ship the Princess Louise”. 
(1804-1840), argued that after examining the coast of Valparaíso from north to south, the elevation on the coast “was everywhere confirmed”.\textsuperscript{858} He found “masses of syenite, which lay half of three or four feet above the level of the sea during the last earthquake in 1822”, which became the main evidence of the uplift.\textsuperscript{859} In spite of this, Meyen’s observations still casted doubts over the elevation of the land in Valparaíso, so, in order to dispel them, the periodical decided ask him for further details. The new report confirmed the uplift on Valparaiso’s coast. However, he insisted that this was a local phenomenon, indicating that there was no real proof to support the elevation of the interior of the continent, and further arguing that there were even fewer arguments to link this process to mountain formation.\textsuperscript{860}

The second German account introduced by \textit{The Foreign Quarterly Review} to settle the debate was the analysis made by the naturalist Eduard Poeppig (1798-1868). Poeppig visited Chile between the years 1826-1829, and his travel account was published in 1835. In his book, he argued that the origin of the Chilean hills was comparatively modern, due to the “rapid and unconnected rising and elevation of whole districts along the coast, which has been observed to take place in all greater earthquakes in Chili, and was particularly striking during the great earthquake of 1822”.\textsuperscript{861} Furthermore, the naturalist contributed to the discussion by analysing another overlooked phenomenon: the formation of a flat coastal area. According to Poeppig, this process was caused by the accumulation of material, particularly visible in the large mouth rivers like Biobio and Maule.\textsuperscript{862} In sum, Poeppig’s account supported Maria Graham’s observations, and introduced a second geological process which coexisted with the previous one, providing a much more complex analysis of the Chilean orogeny.

With these two accounts, \textit{The Foreign Quarterly Review} confirmed the elevation on the coast of Valparaíso as a fact. What is particularly relevant is the way in which the journal committed itself to find European accounts to explain the consequences of the earthquake. Why not write directly to the Chilean government or any other specialised institution to study the matter? The status of northern European science, particularly German knowledge in the field of natural sciences, needs to be considered here. By the mid-nineteenth century, European science was beginning to occupy a normative position regarding what was scientifically acceptable, setting


\textsuperscript{859} “Art. I Reise Um Die Erde,” 10.

\textsuperscript{860} “Art. I Reise in Chile,”13.

\textsuperscript{861} “Art. I Reise in Chile,”16.

\textsuperscript{862} “Art. I Reise in Chile,” 16–17.
the parameters for methodologies, scientific language and mechanisms of objectivity. In light of this, Poeppig and Meyen’s accounts were immediately validated by the scientific community, while the South American report, which argued the opposite, was quickly dismissed.

Furthermore, the role of place and how science practitioners are connected and entangled in networks of circulation of knowledge is also relevant for understanding why knowledge is legitimated or not. Rivero did not have the opportunity to present new arguments to further support his observations and research in the field, at least in the Anglo-American sphere. Likewise, there is no additional information about Rivero’s further engagements with the transnational debate, as his political activity moved his interests into other areas. Nevertheless, in 1857 Mariano de Rivero published his scientific memoirs [Colección de memorias científicas, agrícolas e industriales], which has been characterised as his magnus opus. This two-volume work abridged his most important contributions to natural history and Earth sciences, analysing different subjects such as mining and mineral resources, weather observations, Peruvian antiques, and agriculture, among others. The publication of these volumes was an opportunity to further engage with the debate about the effects of earthquakes on the planet’s crust and to endorse his observations and analysis; however, he did not make use of it. Instead, Rivero re-issued his letter to the French naturalist Alexandre Brongniart about the geology of Chile previously published in the Chilean press. The selection of this particular text shows the value Rivero attributed to his analysis of the geological formations of the Chilean territory, and how this article was perceived as a novel and original contribution to science. Moreover, by the mid-nineteenth century, the most renowned naturalists such as Alexander Von Humboldt had started to support the theory that land formation was the result of a continual, gradual process that shapes the crust of the planet. Nevertheless, these vulcanists ideas remained contested.

864 Mariano de Rivero, Colección de Memorias Científicas, Agrícolas e Industriales Publicadas En Distintas Épocas (Bruselas: Imprenta de H. Goemaere, 1857), 40–50.
Networks and Social Status among the scientific community

The Geological Society of London played an important role not only in discussing geological knowledge, but also in its circulation and social validation. Furthermore, key positions within the society were used to promote and legitimate certain theories or knowledge. As Lorraine Daston has acknowledged, “knowledge does not exist by itself. It is always embedded in artefacts or embodied in individuals, communities, or institutions.”

This section analyses the role played by the President of the society Charles Lyell in the debate surrounding the effects of earthquakes during the 1830s as a good example of the way in which social status and connections to scientific networks of knowledge are important factors in the social validation of scientific knowledge production.

Charles Lyell was the president of the Geological Society of London between the years 1835-1837 and 1849-1851. He studied at the University of Oxford, specialising in mineralogy and geology. His early career was focused on the study of stratigraphy, the branch of geology concerned with the origin, composition, and distribution of strata. During these years, Lyell started to build networks with scientists in Great Britain and continental Europe, becoming a member of the Linnean Society, a Fellow of the Royal Society and a contributor to the journals *The Athenaeum* and *Quarterly Review.*

With the publication of his book, *Principles of Geology: Being an Inquiry How Far the Former Changes of the Earth’s Surface Are Referable to Causes Now in Operation*, in 1830, Lyell presented his theories about the modern changes on the Earth’s crust as examples of the gradual geological transformation of the planet. As President of the Geological Society of London, Lyell used the anniversary meetings as a platform to promote and validate his theories before the geological community. Thus, his subjects of interest such as the increased elevation of land as a consequence of earthquakes became a topic that was frequently discussed in the Geological Society during his presidency. In the annual presidential address of 1836, Lyell argued that most of the memories published in the Proceedings of the Society related to ongoing changes on the surface of the Earth or were proof of antient geological transformations. As President of the Society, Lyell used the case of the Concepción earthquake to demonstrate the recent changes to the earth’s surface, and to

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868 Rudwick.
undermine the position of those who argued against vulcanists ideas, as well as push his own theoretical agenda.

For example, at the 1836 anniversary meeting, Lyell read the paper entitled “the effects of modern earthquakes in upheaving and depressing the land”, taking into account new testimonies and further evidence of the elevation and modern changes to the Earth’s crust following the 1835 earthquake.\textsuperscript{870} First, Lyell addressed the testimony of Robert Alison, a British man settled in Valparaíso, who assisted Darwin in his observations, \textsuperscript{872} and Alexander Caldcleugh who had stated that the increase in elevation of Santa María Island was about eight feet.\textsuperscript{872} Additionally, Lyell addressed the account written by Robert Fitz Roy, the captain of the \textit{Beagle} expedition to South America and the Pacific (1831-1835). Fitz Roy’s notes described the “remarkable alterations produced by the earthquake of February”, particularly addressing the changes to Santa María Island and Talcahuano bay.\textsuperscript{873} Lyell drew upon Fitz Roy’s social status and authority as naval officer to legitimate his conclusion regarding the effects of the 1835 earthquake, noting his experience as a hydrographer, and more importantly, his observations of the geological phenomena in situ.\textsuperscript{874} According to Lyell, Fitz Roy’s observations “will remove all doubts from the minds of those who have questioned the power of earthquakes to cause the permanent upheaval of land”.\textsuperscript{875} In particular, the case of Santa Maria Island, registered by Fitz Roy and Caldcleugh, became the most important piece of evidence in support of Lyell’s theory on the recent changes brought about by earthquakes in land formation and elevation.\textsuperscript{876}

These new pieces of evidence led him to indicate that there was more proof in favour of the increased elevation of land after the earthquake than against: “I may remark, however, that since we have ascertained the fact of a rise of three, five, and even ten feet in parts of the same country in 1835, so distinctly attested by Captain Fitzroy, all doubts entertained as to the permanent effects of a proceeding convulsion are comparatively of small interest”.\textsuperscript{877} Lyell then compared Fitz Roy’s account with the observations made by Maria Graham after the 1822

\textsuperscript{870} Lyell, 373.
\textsuperscript{872} Lyell, “Address to the Geological Society …” 374.
\textsuperscript{873} Lyell, 374.
\textsuperscript{874} Lyell, 374.
\textsuperscript{875} Lyell, 374.
\textsuperscript{876} Lyell, 375.
earthquake on Valparaíso’s coast. The vulcanist geologist highlighted the fact that both Graham and Fitz Roy reached the same conclusions about the gradual process of elevation of land after observing the effects of earthquakes.\textsuperscript{878} By comparing these two testimonies, Lyell legitimated Graham’s observations and conclusions about the uplift of Valparaíso’s land, dismissing, at the same time, the evidence which indicated the contrary. In addition, Lyell referenced two new testimonies that supported the increased elevation of Valparaíso’s terrain: Dr. Meyen’s travel account, and Alexander Cruckshanks, an English botanist who resided in Chile, who was contacted and interviewed by Lyell, confirming the elevation of the terrain in Quintero bay.\textsuperscript{879} Lyell used his position as president of the society to dispel any doubts about the changes in elevation of the Chilean coast in 1822, arguing that this scepticism should be disregarded when compared with data of the 1835 earthquake.\textsuperscript{880}

Moreover, new evidence from Chile’s latest earthquake further supported Lyell’s geological theories. In the meeting of 4 January 1837, Lyell read a paper entitled “Some observations on the Elevation of strata on the coast of Chili” written by Alexander Caldcleugh, and Charles Darwin’s essay “Observations of proofs of recent elevation on the coast of Chili (…)”, which confirmed the modern “alterations in the relative level of land and sea”,\textsuperscript{881} providing further proof of the gradual elevation of the continent.\textsuperscript{882} What is noteworthy was the way in which Lyell exposed the content of these reports, as well as the status and credentials of the authors, whose knowledge and expertise in the field of geology was not questioned. The reading of these reports gave Lyell the opportunity to settle the discussion surrounding the recent elevation on the Chilean coastline,\textsuperscript{883} using this data as the proof needed to reinforce his own theories about the formation of mountain ranges and the orogeny of the earth, linking the authors’ fieldwork with his own theoretical agenda.

These Vulcanist ideas were promoted again at the anniversary meeting of 1837, as Lyell introduced the most relevant subjects of modern geology. At this occasion, he used his presidential position to feature new proof of elevation of landmasses, namely in Scotland,\textsuperscript{884}
England, Sweden, and Chile. The latter was used as the main example of modern alterations of the level of the land, drawing upon Caldcleugh and Darwin’s accounts, and dismissing altogether the evidence provided by Mariano de Rivero. Lyell’s role in the Geological Society shows the way in which science, particularly what is deemed to be accurate, correct, or true, is constructed within a framework of networks, practices, and institutions.

By the 1840s, volcanist ideas had gained even more support among the British scientific community, presenting new pieces of evidence that supported the relationship between earthquakes and changes in land elevation. In 1842, the *Journal of the Royal Geographical Society of London* published a new testimony about the recent changes produced by earthquakes to the Chilean landscape. According to the publication, Dr. Weyman, a naturalist named as a protégé of Humboldt, argued that Chile, and particularly its northern province of Copiapó, was undergoing most interesting changes derived from the constant agitation from earthquakes. By arguing that “Valparaíso and most parts of the coast of Chili have risen several feet from the level of the sea of late years”, Weyman’s observations had the potential to end the argument between Neptunians and Vulcanists over the effects of earthquakes.

**Gender revisited: Formal training and the role of specialisation in knowledge validation**

Maria Graham and Charles Darwin both wrote thorough accounts of the 1822 and 1835 earthquakes, describing what they observed in each case: the timing and duration of the events, the intensity, and the direction of movement. This information was followed by descriptions of the effects of the earthquakes, focusing their accounts on the evidence of uplift on the coast. In spite of providing similar data, the reception of their reports by the scientific community was unequal. This section argues that the educational credentials and the specialisation of individuals dedicated to science were beginning to be perceived as crucial for the social validation of scientific knowledge during the 1830s. These factors add another dimension to the gender analysis, by highlighting the fact that only men were allowed to acquire a formal training at a university level, and therefore, were able to become professionals and specialists in a particular field of knowledge. The reception of Darwin’s early work regarding the geology of South America, especially his analysis on the effects of the 1835 earthquake, constitute a

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885 Lyell, 505.
886 Miller, “Notes on South America and Oceania,” 137.
887 Miller, 137.
relevant case for understanding the role played by formal education and specialisation in the social validation of knowledge.

Charles Darwin (1809–1882) was an English naturalist, biologist, and geologist. His education at Edinburgh and Cambridge Universities contributed to his expertise and specialisation in geology and natural sciences. From an early age he was introduced to an active naturalist community. For example, at Edinburgh University, he attended the meetings at Wernerian Natural History Society, he joined the Plinian society, a club for students interested in natural history, and he registered for Robert Jamenson’s natural history course, where he learnt botany, zoology, palaeontology, mineralogy, and geology. According to James Secord, Darwin’s experience in Edinburgh, principally with Jamenson’s class, exposed him “to one of the leading courses of natural history in the world and had [granted him] a firm grasp of strata and mineral identification”. Additionally, in this academic environment he learned to appreciate “geology as a global science dealing with process in action”. At Christ’s College, Cambridge, he continued his specialisation in natural sciences, meeting prominent naturalists and geologists, such as professor John Henslow and Adam Sedgwick, who provided him with their guidance. With Henslow, Darwin was able to access the most up to date research in the natural sciences as he was introduced to Humboldt and Herschel’s work. As Norman has acknowledged, under the tutelage of Sedgwick, Darwin was able to convert his theoretical education “into a suite of practical skills in observation, collection, note taking, identification, measurements of dip and strike, and mapping”, shaping Darwin’s specialised formation in Earth sciences.

Darwin’s early accounts of the Beagle’s voyage reflect this learning experience as a naturalist, particularly in terms of methodology. For example, his paper “Geological notes made during a survey of the East and West Coasts of South America (…)”, skilfully combined his observations with local testimonies, and contemporary geological information with fossil evidence. It received great attention from the geological community, particularly from the

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890 Secord, 142.
893 Norman, 49.
894 Charles Darwin, “Geological Notes made during a survey of the East and West Coasts of South America, in the years 1832, 1833, 1834, and 1835, with an Account of a Transverse Section of the Cordilleras of the Andes.
Geological Society of London, because it argued in favour of Lyellian ideas about the gradual elevation of the planet, presenting new pieces of evidence for the uplifting of land in the Cape Verde Islands, Patagonia, and central Chile.895 Darwin’s engagement with contemporary geological discussions can be appreciated in his 1837 essay “Observations of proofs of recent elevation on the coast of Chili (…)”, where he argued that there was no doubt that the earthquake of 1822 changed the elevation on the coast, pointing out that “he met with no intelligent person who doubt[ed]” it.896 Additionally, he concluded that the uplifting of the shore was a gradual and uneven process, indicating “that the land on the coast of Chile has risen, though insensibly, since 1822”.897 With this statement, Darwin and Lyell aimed to close the Graham/Greenough debate once and for all.

In the late eighteenth and early nineteenth centuries, geological analysis was mainly focused on the description of natural phenomena.898 However, Darwin’s early research shows a different tendency. For example, in his 1837 paper, Darwin focused his research on the search for larger patterns in nature, particularly examining the geological structure of the continent. He found that similar marine fossils existed on the Atlantic border of the continent, but, he asked, how could such a phenomenon happen without any earthquake or volcanic activity? The latter led him to think that “the earthquakes, volcanic eruptions, and sudden elevations on the coastline of the Pacific, ought to be considered as irregularities of action in some more widely extended phenomenon”.899 With this corollary, Darwin connected what were previously thought to be solely local phenomena to wider geological processes, thinking about the continental mass as a whole.

Darwin’s education and fieldwork experience granted him the tools to produce more specialised knowledge in the field of geology. As Daniela Bleichmar has explained, his work was influenced by Alexandre von Humboldt’s methodology. Darwin employed a “synthetic, analytical approach that Humboldt had pioneered, combining his own data with those of others in search of general laws”.900 His observations and fieldwork research in South America allowed him to create major contributions to geology, linking diverse natural processes and

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895 Darwin, 210–12.
897 Darwin, 448.
different geological time periods. As Norman has highlighted, these major contributions “have been obscured by the impact of his Origin of Species”.

Moreover, his experience on board the Beagle profoundly shaped his identity as a science practitioner, leading him to recognise himself as a geologist. This is relevant as it shows the willingness of Darwin to belong to a particular scientific community that had developed a specialised set of practices and language.

Furthermore, Darwin was part of a radical change in how geological knowledge was produced. As the new president of the Geological Society Rev. William Whewell (1794-1866) recognised in 1838, geology was undergoing important changes, which were described by him as a “revolution in the mode of treating the subject of geology”. In his anniversary address to the society, Whewell explained that the field was being divided into two subjects ‘Descriptive Geology’, which had as its objective “the description of the strata and other features of the earth surface as they now exist”, and ‘Geological Dynamics’, the division of the field that examined and reduced to law the causes of geological phenomena. For Whewell, the former kind of geology focused on the collection, comparison and classification of geological facts, whereas the latter explored the way in which these facts could be connected into a net of “knowledge of the history of the earth’s changes”. In this shifting scientific environment, Darwin’s work was considered --and admired-- as a major example of Whewell’s geological dynamics.

Darwin’s 1838 paper entitled “On the connexion of certain volcanic phenomena (…)”, was considered by the geological community to be an eloquent example of the search for general understanding and production of natural laws to understand nature. In this essay, he argued that there were “three phenomena exhibited during the earthquake of February of 1835, viz. a submarine outburst, renewed volcanic activity, simultaneously at distant localities, and a permanent elevation of land”. According to the geologist, the Chilean earthquake of 1835 “marked one step in the elevation of a mountain chain”. More importantly, the observation

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904 Whewell, 632.
905 Whewell, 632.
906 Whewell, 659.
908 Darwin, 659.
of this local phenomenon led him to establish further connections between volcanic activity, earthquakes, and the formation of mountain-chains. Darwin’s work on this subject was highly praised and celebrated among the British scientific community. Whewell, as president of the Geological Society, positively commented on Darwin’s findings about the elevation of landforms and geological time, also declaring his admiration for “the clearness and force” of Darwin’s investigation and arguments.909

Finally, by classifying the production of geological knowledge in ‘Descriptive Geology’ and ‘Geological Dynamics’, Whewell was creating a hierarchy of knowledge in which the second type of scientific endeavour had more value.910 In this scenario, Maria Graham’s report about the 1822 earthquake ended up being accepted by the geological community as an asset for the description of a geological phenomenon, in this case the elevation of land as the result of an earthquake. Charles Darwin’s geological research, on the other hand, was granted as one of the most important pieces of evidence of the gradual and dynamic changes that the planet has experienced in recent and ancient times. His work was viewed and valued as theoretical and empirical. The positive reception of his research illustrates the changes in scientific knowledge production in the mid nineteenth century, particularly regarding the specialisation of knowledge, and the beginnings of the professionalisation of science. As this case shows, the new scenario of knowledge production enabled the participation and collaboration of female and non-European actors, but mainly as contributors of data and information.

Conclusions

As the political scenario in the 1820s introduced important changes in Spanish America with the dissolution of the Spanish Empire and the emergence of new political entities, the region attracted several new transnational actors. Naturalists and science practitioners were eager to produce new knowledge about the continent’s unique natural features. Chile’s coastal lands, in specific, became an important testing ground for geological knowledge. Since the late-1700s, Chile had attracted the attention of naturalists interested in the earth sciences. Notably, Chile was valued because it was thought to be the house of considerable mineral wealth. However, its constant seismic activity drove the attention of naturalists to the study of earthquakes. This

910 Michael Reidy has also analysed the role played by Whewell in the specialisation of hydrography and the global study of tides. Reidy, Tides of History, 236–70.
chapter has shown how science practitioners used the evidence provided by the Chilean earthquakes of 1822 and 1835 to examine their effects in land-elevation. Previous earthquakes in Europe and America in the late eighteenth and early nineteenth centuries had been less intense; therefore, their effects on the surface were less clear. The magnitude and intensity of the Chilean events, however, permitted science practitioners to observe, analyse, measure and discuss the changes to the Earth’s surface, opening this environment to scientific examination. If in the 1700s and early 1800s the Chilean coastal lands had been solely valued because of their position in the transoceanic navigation, in the 1820s and 1830s, they also offered the perfect natural scenario to put to test geological theories about land-formation and to produce new knowledge about the effects of seismic activity on the terrain.

Maria Graham’s analysis on the 1822 earthquake triggered a transnational scientific debate. The focus on this debate has contributed to the study of the social dimension of science-making, shedding some light on the ways in which social factors, such as gender, place, and connections to scientific networks influenced and impacted the social validation of scientific knowledge. In particular, the reception and response to Graham’s 1822 earthquake analysis are significant to analyse how gender affected the validation of knowledge. Building on existing historiography on gender and science, this chapter has demonstrated how women science practitioners in mid-nineteenth century had to develop particular strategies to legitimise their knowledge production, and find alternative spaces to promote their work, as their access to scientific societies and publications was restricted. As she engaged in the debate against the President of the Geological Society, George Greenough, Graham developed a feminised scientific discourse, weaponizing her alleged lack of geological knowledge whilst highlighting Greenough’s own interests and theoretical agenda. This gendered dimension of science making does not only apply to female actors. As this transnational debate has shown, male science practitioners used their power and position to validate and legitimate their knowledge production. In this case, both Greenough and Rivero used their position as learned men of science to subvert Graham’s credibility as a lay person. Moreover, Greenough instrumentalised his leadership position among the scientific community to undermine Graham’s research, even going as far as to invent new data just to discredit her. In this scenario, it is also worth noting how male and female actors used the discourse and practices of scientific objectivity to validate their research. Graham, as well as her male counterparts, mainly Rivero, Poeppig, and Darwin, relied on the discourse of objectivity to legitimatise their knowledge among their peers, basing their arguments on the accuracy of their observations and records, as well as the use of scientific
instruments. Furthermore, the use of this language and practices tied them into a transnational scientific community.

The debate on the effects of earthquakes on the surface of the planet in the 1820s and 1830s circulated across the Atlantic world, with networks extending from Britain, Chile, United States, Germany, France, and the River Plate region. These transnational knowledge networks not only provided the space to exchange scientific observations and information; they were also crucial for validating and legitimating them. However, where knowledge is produced and how these actors were connected to scientific networks mattered greatly for the circulation and validation of knowledge. By studying the cases of Rivero, Darwin and the reception of German naturalists such as Poeping and Meyen, this chapter has argued that not all science practitioners had the same capabilities and opportunities to participate as equals in these transnational networks. In particular, I examined how Spanish American knowledge was integrated into transnational scientific networks after the dissolution of the Spanish Empire and the emergence Britain as a global power. As Rivero’s case demonstrates, Spanish America-based science practitioners actively participated in the naturalist networks of the nineteenth century, not only providing new pieces of evidence, but also backing their observations up with scientific theory. Nevertheless, the contributions of these actors were many times underestimated, silenced or dismissed. This is significant as it highlights the asymmetrical nature of intellectual and scientific entanglements in the mid nineteenth century. Place, as well as status and connections to scientific networks were crucial factors in the legitimation and social validation of knowledge.

By the mid-nineteenth century, the validation of scientific productions was also determined by the increasing specialisation, professionalisation, and education of science practitioners at a university level. This adds another dimension to the gender perspective, as only male science practitioners were allowed to receive formal training and participate in scientific societies. The reception of Darwin’s early scientific work on geology permitted to explore how the specialisation and formal training of scientists contributed to the social validation of their research. Even though Darwin reached for similar conclusions that Maria Graham after her study about Valparaíso’s earthquake, his observations and analysis were not questioned. On the contrary, they were granted as the final proof that supported Vulcanism as a viable geological theory. Moreover, the favourable reception of his work by the presidents of the

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The Geological Society, Lyell and Whewell, showcases the emergence of hierarchy in knowledge production that privileged the contribution of specialists and professionals over the work of amateurs.

Furthermore, the process of institutionalisation of science had greater impact in the legitimisation of knowledge productions. The emergence of institutions such as the Geological Society of London changed the way in which knowledge was socially validated in the nineteenth century. These institutions were used as a platform to promote particular practices and methods, standardising the procedures of the production of knowledge. By the 1830s, these institutions were becoming increasingly more relevant in determining what counted as knowledge and who participate in the networks of scientific knowledge. Moreover, as the testimonies of George Greenough and Charles Lyell demonstrate, the positions of power inside these societies were used to promote and validate certain theories and to legitimate certain kinds of knowledge. Likewise, membership of these societies generated mechanisms of integration, opening spaces of discussion and scientific networking, becoming crucial spaces for the socialisation and specialisation of science.

Finally, the reception of Graham, Rivero, and Darwin’s works regarding the effects of the Chilean earthquakes also reveals the significant changes undergone by science in the mid-nineteenth century. In particular, the unequal reception of their research addresses the role of power relations in the social validation of science at the end of the Age of Revolutions. By the 1840s, Darwin was regarded as one of the leading authorities on geology. His research on South America helped him to create new knowledge that linked volcanic activity, earthquakes, and the formation of mountain-chains and landmasses throughout geological time. Moreover, as prominent Vulcanists such as Lyell and Whewell held positions of power among the scientific community, Maria Graham’s work on the coast of Valparaíso was highly regarded as an example of the modern alterations posed by earthquakes. Rivero’s work, on the other hand, was marginalised and removed from the scientific debate over the effects of earthquakes. Notably, these cases show the emergence of a global hierarchy of knowledge by the end of the Age of Revolutions, where Northern-European scientific knowledge and institutions were regarded as having the monopoly on legitimate knowledge and scientific truth.
Conclusions

Boundaries of space and time have often restricted the analysis of the history of Spanish America. Political categories such as nation-states have constrained historiographical research to national units, limiting the analysis of cultural and intellectual entanglements across different regions. Moreover, historiographical divisions, such that between the colonial and republican periods, have skewed historians’ understanding of the past. While these divisions have been instrumental for nation-building and nationalist narratives of the past, they have been less useful for addressing change and continuity from one period to the next. By studying the construction of knowledge about the SEP during the Age of Revolutions, this thesis presents new ways of thinking about the history of Spanish America from the late colonial to the early republican periods, analysing it as part of an interconnected global system of political, military, and intellectual networks and entanglements. In this vein, the transnational approach of this project has allowed me to depart from traditional maritime histories that solely focus on a specific empire or nation. As this thesis emphasises, the production of geographical knowledge about the globe’s ocean and maritime regions was a transnational endeavour that not only involved the deployment of naval resources and the development of a variety of technologies, as existing historiography has highlighted; it also involved the participation of diverse groups of transnational actors.

This thesis is also in dialogue with the growing scholarship on the Pacific region, highlighting the role played by Spanish American actors in the construction of knowledge about this seascape. In so doing, this research has reassessed the engagement of Spanish Americans towards the Pacific Ocean, which had been largely overlooked in previous studies. Furthermore, this thesis has incorporated an extremely diverse range of primary sources, from printed works such as voyage accounts and natural history books, to press, to manuscript documents, including letters, reports, and cartography. This diversity of primary sources showcases the different forms that geographical and hydrographical knowledge took during the eighteenth and nineteenth centuries. The inclusion of maps represents a significant methodological contribution to the study of the production of knowledge about the Pacific in general and the Spanish American rim in particular. Ultimately, this thesis acknowledges the various ways in which knowledge was produced and circulated globally in the Age of
Revolutions, foregrounding overlooked and previously understudied actors and geographical spaces.

What follows further elaborates on the main conclusions and contributions of this research. These sections touch on a variety of subjects, ranging from historiographical contributions to the debate about change and continuity from the colonial to the national periods in the history of Spanish America, to the recognition of hitherto marginalised actors in the construction of geographical knowledge, and new ways of thinking about transnationalisms in the region.

The geopolitics of knowledge

This thesis has demonstrated how during the Age of Revolutions, knowledge became a key vehicle for imperial competition. Historians have long stressed the importance of scientific knowledge as a tool for empire building. Study of the SEP has also revealed that imperial rivalries were fuelled by the production of geographic, hydrographic, and cartographic knowledge about maritime spaces, particularly the rivalry between Spain and Britain in the South Atlantic and Pacific regions. For centuries, the SEP had been regarded as the portal to the Pacific region; precise knowledge of this area was considered crucial for its dominion and for defence. In the 1740s, the British Admiralty challenged the military and political dominance of the Spanish Empire over the South Sea by sending a fleet to seize the wealth of the Pacific commercial trade and to attack Spanish possessions as many other enterprises had done in the past. However, the political and cultural scenario of the mid-eighteenth century changed the impact of this enterprise, as the rivalries between Britain and Spain arose in the midst of the War of Jenkins' Ear (1739-1748), and as the interest in travel narratives grew and the publication of these texts expanded. By publishing an account of the adventures and misadventures of the voyage, the British made new knowledge about the geography of the Pacific region public. In particular, the voyage account described the different landscapes and how to traverse crucial navigational passages in detail, further incorporating graphic information such as drawings and maps. This event accelerated imperial rivalries in the SEP, triggering a longstanding competition to produce geographic, cartographic, and hydrographic knowledge of the region during the second half of the 1700s and the early 1800s.

As a result, the SEP attracted attention, becoming an important space of knowledge production during the Age of Revolutions. Both Britain and Spain organised hydrographic expeditions to survey and map this seascape. These expeditions directed special attention to the study of the
navigational passages connecting the Atlantic and Pacific oceans, namely Cape Horn and the Magellan Strait, as well as southern islands such as Tierra del Fuego, Staten Island, and Juan Fernández Island, which were conceived as potential stepping stones for transoceanic navigation. The study of hydrographic enterprises, even more than that of land-based initiatives, illustrates the extent to which science-making was a political, ideological and economic project. As a maritime region, the SEP was a fluid space that was more likely to be subject to knowledge competition because of the difficulties of securing it and demarcating its borders as is done on land. Ultimately, the rivalry between the Spanish and British Empires during the Age of Revolutions transformed the SEP into a contested space, shaping the way in which it was conceived, depicted and experienced through navigation. From a little-known region for European navigation, the SEP became a crucial space for the forging of global connections, and was instrumental in the imperial and colonial projections of the Spanish and British empires. Furthermore, the changes introduced in the maritime sciences, referred to here as scientific navigation, transformed the hitherto marginal geographies of the SEP into objects of scientific scrutiny and depiction. Places such as the Falklands and Juan Fernández Islands acquired global importance and value as their hydrographical features were described and recorded, thus making navigation and docking safer and more efficient.

Printing also played a significant role in the geopolitics of knowledge production and circulation during the Age of Revolutions. As has been shown in this thesis, the publication of voyage accounts and contingent documents, such a maps and maritime charts, was perceived as a crucial instrument for stoking imperial rivalries in the eighteenth century. With a vibrant print culture, the British created a tradition of publishing voyage accounts and maps during the seventeenth and eighteenth centuries, which was reinforced and amplified during the Age of Revolutions. British actors maintained that the publication of travel narratives and geographical documents was at the core of the liberal and Enlightenment values of openness and commitment to dissemination of knowledge. In this context, secrecy came to be considered as backwards. Printed forms of knowledge, particularly books and maps, were transformed into political and cultural tools that projected imperial power. Spanish officers reacted to this publishing practices with ambitious projects of research and publication in the late 1700s. However, as this thesis has demonstrated, their results were modest. While Antonio de Córdoba’s hydrographic results were published, they did not achieve the popularity and wide circulation of the British accounts. Moreover, the records of the most important Spanish scientific enterprise of this period, Alexander Malaspina’s expedition, remained unpublished;
his reports were left in the metropolitan archives, only to be published many decades later. Similarly, the products of the Spanish American hydrographic enterprises in SEP waters remained mostly unpublished. The results of these expeditions were treated as a geostrategic state affair; secrecy was considered key. By the turn of the nineteenth century, the British had the upper hand. The publication and wide dissemination of its principal hydrographic enterprises, particularly James Cook’s three voyage accounts, made them the leading power in the production of knowledge about the Pacific region in general and the SEP in particular.

Following the dissolution of the Spanish Empire in the Americas, the 1820s and early 1830s saw a reconfiguration of political power in the SEP. These pivotal years initiated a new phase in Pacific navigation, commerce, and very importantly, knowledge production, during which the British reinforced their dominion over the region. The hydrographic expeditions of Parker King and Fitz Roy during this period illustrate the engagement of the British Admiralty with the production and publication of scientific knowledge about the SEP. Crucially, the analysis of these expeditions has shown how relevant knowledge production was in Britain’s emergence as the leading imperial power after the demise of Spanish dominion in South America. The findings of these hydrographic enterprises made steam navigation through the Magellan Strait possible from the 1840s, connecting the Atlantic and the Pacific worlds more efficiently and more safely. While existing historiography has emphasised the economic, military, political, and cultural entanglements of Britain and the new Spanish American states during this period, this thesis has highlighted the particular importance of knowledge production and transfer in the emergence of Britain’s informal empire in South America and the South Pacific.

In 1826, the Spanish Empire lost its last colonial possession in the SEP when Chiloé Island was seized by Chilean forces. The Independence Wars not only lost Spain the colonies in the Americas; crucially, they also cost Spain rapid access, connection and projection towards the Pacific region, even though they still had the Philippines. Nevertheless, by the mid-nineteenth century, a renewed imperial discourse emerged in Spain. Efforts to reoccupy Santo Domingo in the Caribbean Sea between 1861 and 1865 coincided with imperial undertakings in North Africa (Morocco), Mexico, and the South Eastern Pacific. In an attempt to reassert its cultural influence over the former colonies in South America, the Spanish Crown organised a scientific commission [Comisión Científica del Pacífico] to study the natural history of the region and collect specimens to enrich and update the imperial corpus of knowledge. However, conflicts with the Peruvian government led the members of the scientific commission to take over the guano-rich Chincha Islands, triggering a war against Peru and Chile from 1864 to 1866. The
conflict had significant political and cultural consequences: anti-Spanish sentiments were reasserted across the region, and discourses of Hispano-Americanism were reignited among the Latin American nations.

The republics that emerged out of the carcasses of the Spanish Empire were developed in the midst of this shifting geopolitical scenario. The fact that the archetypal works of nation-building such as Claude Gay’s *Atlas of the Physical and Political History of Chile* [*Atlas de La Historia Física y Política de Chile*], drew heavily upon works of British and Spanish colonial origin, is symptomatic of this shift. This is relevant because it reveals how the geographical imagination of Chile as an independent republic became entangled with imperial and colonial representations of this environment. For example, the cartographic depictions of Patagonia and Tierra del Fuego produced by the British expeditions undertaken by Parker King and Fitz Roy were incorporated into the Chilean national representations of the national territory. Additionally, Gay introduced Spanish depictions of the Western Patagonian channels and Juan Fernández Island, nationalising what were hitherto colonial geographies. Furthermore, as early as the 1830s, the Chilean Navy organised the first national hydrographic expeditions to study and map the Chilean littoral and assert their control of this region. The Chilean Navy surveyed and mapped what were considered relevant places for the navigation and development of port activities for the newly founded republic, charting the bays of Quintero, Constitución, and the mouth of the Bueno River in the early 1840s. Historians have dismissed the importance of these expeditions on account of their being sporadic events that were conducted unsystematically, highlighting at the same time the role of hydrographic enterprises in nation-building in the second half of the nineteenth century, particularly after the institutionalisation of hydrography with the creation of the Hydrographic Office in the mid-1870s. Although I have not argued against the main emphasis of this interpretation, the development of the hydrographic enterprises of the 1830s and 1840s showcases the early attempts made by the Chilean state to nationalise the SEP littoral and to utilise local resources for the benefit of the new republic.

**Transnationalisms and asymmetries of power in knowledge production**

By acknowledging the production of knowledge as a collective endeavour, this thesis has highlighted the role of hitherto marginalised actors in the construction of geographic knowledge during the Age of Revolutions. Specifically, this research recognises and emphasises the active role played by indigenous and Spanish American actors in the production
of geographic and hydrographic knowledge about the Eastern Pacific. Although it was often disregarded or not visible, the knowledge produced by these actors was integrated into global, imperial and, national knowledge systems. From Anson and Malaspina’s reliance on both creole and indigenous experts, to colonial bureaucrats and republican scientists, ‘local’ knowledge was instrumental to the production of geographies of the SEP. Indigenous actors had a particularly active role in the Spanish American expeditions, especially in places where the Spanish Empire had little knowledge, such as the Patagonian channels. Moreover, the analysis of British sealers such as Weddell reveals just how important indigenous actors were, not only providing critical knowledge and information about where to navigate and dock, but also providing the materials and vessels to navigate the southernmost coasts of the American continent. Overall, their crucial participation in British and Spanish colonial geographies further fosters the idea that European geographic and cartographic knowledge was built upon pre-existing spatial networks created and used by local actors, as has been addressed by historians of other oceanic regions and seas, such as the Indian Ocean and the Caribbean Sea.

Building upon the work of historians such as Maroto and Buschmann, this research has also emphasised the role played by creole or Spanish America-based actors. Far from being marginal in the production of knowledge about the SEP, Spanish American knowledge was integrated into global networks of scientific knowledge. As Chapter 3 has demonstrated, hydrographic knowledge produced by Spanish American expeditions to the Western Patagonian Channels was incorporated into imperial cartographic representations of the Spanish Empire. The data and knowledge produced by these expeditions, particularly José de Moraleda’s work on Western Patagonia and the Chilean littoral, was assessed and studied by the British expedition commanded by Robert Fitz Roy, forming an important source of information for studying the geography of the SEP. Moraleda’s cartographic representation of the Western Patagonian region was also integrated into Claude Gay’s Chilean Atlas. Moreover, the analysis undertaken in chapters 3 and 4 attests to the local capabilities for producing scientific knowledge. The work of military engineers and hydrographers showcases how by the late eighteenth century, colonial territories were able to construct knowledge about the American continent.

Furthermore, Spanish American actors produced knowledge about the natural history of the SEP. As the cases of Juan Ignacio Molina and Mariano de Rivero have illustrated, Spanish American science practitioners actively participated in the naturalist networks of the late eighteenth and early nineteenth centuries, not only providing new pieces of evidence, but also
supporting their observations with scientific theories. This acknowledgement contributes to recent historiography in the history of science that challenges the assumption that Latin America was a mere receptor of North-Atlantic knowledge, emphasising the transnational nature of knowledge production and circulation, and the role played by diverse actors in the co-production of science. The former has led some historians to assert the futility of concepts such as centre and periphery for the analysis of global scientific production. Nevertheless, as this thesis has demonstrated, the contributions of Spanish American science practitioners were often silenced or marginalised. The cases of the cartography created by the Lobato-Clemente expedition and Mariano de Rivero’s 1822 earthquake analysis exemplify how the contribution of Spanish American-based actors was obscured by ‘metropolitan’ or ‘centre’ actors. Global or transnational approaches to the history of science and knowledge need to go further than simply stating that there are no centres and peripheries in science-making. It is also necessary to address the power relations that figure in the production and transfer of scientific knowledge. As Chapter 5 has shown, by the end of the Age of Revolutions a hierarchy of knowledge had emerged where northern-European knowledge was regarded as more valuable than the knowledge produced in other parts of the globe, especially knowledge produced in the former colonies of the Spanish Empire. This process critically shaped how the production of knowledge was validated and legitimised in the Americas and in Europe in the mid-nineteenth century. While knowledge produced in institutionalised knowledge centres such as the Hydrographic Office of the British Admiralty or the Geographical Society of London, was regarded as universal, knowledge produced in other parts of the globe was regarded as ‘local’ with a limited impact. The emphasis on power dynamics and the construction of global hierarchies of knowledge allows us to rethink longstanding categories such as centre and periphery, understanding them as being contingent and constantly contested, reviewed, and renegotiated by the diverse actors involved.

During the Age of Revolutions there were coalescing processes that obscured the role played by Spanish American actors and their scientific production. Jorge Cañizares-Esguerra has highlighted the way in which imperial Spanish science was marginalised from narratives of early modern scientific revolutions. According to the historian, traditional historiography has emphasised how the categories used to study early modern science, which emphasises the importance of the Republic of Letters, print culture, the public sphere, discourses of objectivity and facts, among others, marginalises the epistemologies and methodologies used to practice

912 For reference see Aranda et al., “The History of Atlantic Science”; Del Castillo, Crafting a Republic.
science in the Spanish Empire.⁹¹³ Building upon this research, this thesis has addressed how the processes of specialisation and institutionalisation of science contributed to the marginalisation of Spanish American actors and knowledge cultures both before and after independence. The analysis of mapping practices during the Age of Revolutions particularly showed how these processes affected the production and validation of geographic knowledge and the role played by Spanish American and indigenous actors. As the information and knowledge contained in maritime charts and maps became more specialised, the contribution of these actors became increasingly more obscure and was often removed from the records of the scientific expeditions. As it was argued in chapters 1 and 3, knowledge produced by indigenous and Spanish American actors was translated and codified into the language of scientific navigation and the modern techniques of cartography. The acquisition of particular measurements, calculations, and drawing techniques ended up marginalising other ways of mapping and representing territories and seascapes. Furthermore, the creation of centralised institutions like the British Hydrographic Office or the Spanish nautical academies, such as the Academia de Guardiamarinas in Cádiz or the Nautical Academy in Lima, reinforced and validated this particular way of mapping and producing spatial knowledge, transforming it into an increasingly professional endeavour.

Transnational and inter-imperial entanglements in the production of scientific knowledge are at the centre of this thesis. As chapters 1 and 3 have emphasised, the knowledge produced by military and scientific expeditions circulated widely in the Atlantic world. Hydrographers and mapmakers constantly commented, compared, and utilised data and knowledge from previous explorations, regardless of their nationality and origin of the information. Even though the British and Spanish hydrographic enterprises were competing with one another to generate the most accurate knowledge, there was an implicit level of collaboration, dialogue, and discussion that transcended the boundaries of the Empires. This realisation offers new opportunities for historiographical analysis that overcomes the confines of imperial and national perspectives, emphasising the transnational connections and mutual influences in the production and transfer of scientific knowledge in the eighteenth and nineteenth centuries.

This thesis also contributes to the rethinking of knowledge connections and the nature of transnational entanglements. Chapters 3 and 5 have demonstrated the importance of regional networks in the production of geographic, cartographic, and hydrographic knowledge in

Spanish America during both the late colonial and early national periods. This has important ramifications for understanding the production of scientific knowledge in the region. First, this work redirects our attention to local and regional connections. For example, the knowledge produced by the Chiloé expeditions to the Western Patagonian channels in the second half of the eighteenth century circulated widely between the colonial authorities of Chiloé, Santiago, Lima, and even reached the authorities in Buenos Aires and Montevideo. In turn, this generated a corpus of locally generated knowledge about the maritime geographies of the southern parts of the American continent. Second, it highlights the importance of locally generated knowledge and institutions in the production of scientific knowledge in Spanish America. As demonstrated via the example of the Nautical Academy of Lima, by the late colonial period the Spanish American territories had established local institutions to formally train local men in the endeavours of scientific navigation.

Furthermore, regional entanglements across the diverse territories of Spanish America were found to be crucial for the development of local scientific capabilities after the dissolution of the Spanish Empire. As argued in chapter 3, Lima’s Nautical Academy provided the capabilities and skills for the creation of new knowledge institutions at regional levels after the fall of the Spanish Empire, such as the short-lived Nautical Academy of Valparaíso in the mid-1820s. Moreover, both of these institutions offered the cultural and knowledge frameworks required for the development of the first national hydrographic expeditions of the Chilean republic in the 1830s and early 1840s. Crucially, the study of institutions such as Lima and Valparaíso’s Nautical academies sheds light on the regional circulation of knowledge and people during the Age of Revolutions, highlighting what Miller has called ‘localized transnationalism’ in Spanish America. This understanding of regional intellectual and knowledge connections offers a more nuance view than previous scholarship on the History of Science in the region, especially for the Chilean case, where research often have highlighted the role played by foreign -usually European- science practitioners. This approach, in turn, addresses the importance of Spanish American knowledge in the development of science and knowledge infrastructure during the early national periods.

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914 Miller, “Republics of Knowledge: Interpreting,” 78.
Informal knowledge networks

The role of British whalers and sealers has been downplayed in previous analyses of British exploits in Spanish America in the late eighteenth and nineteenth centuries. Existing historiography has underscored their role in informal commercial activities and involvement in contraband, mainly in the 1790s and 1800s. However, fewer publications have considered their role in the construction of transnational networks of knowledge. As this thesis has demonstrated, whalers and sealers made important contributions to the establishment of new empirical knowledge about the geographies of the SEP. They created new ways of traversing and experiencing this seascape, garnering precise knowledge about its coasts, islands, and channels, and, crucially, of where to strand and take on water, timber, and food. This knowledge was transferred to and used by the hydrographic and military expeditions of the British and Chilean Navies. The experiences of whalers and sealers in the southern passages provided relevant knowledge which was later used in the construction of the geographical descriptions and cartography produced by the British expedition commanded by Robert Fitz Roy in the 1830s. Sealers in particular were central actors in the Chilean military campaign that claimed the Magellan Strait. Their knowledge was instrumental for the Chilean colonisation project, providing key information about how to navigate the intricate interior channels of Western Patagonia.

Sealers and whalers such as Colnett and Weddell developed important voyage accounts of the SEP that circulated across the Atlantic world. These accounts described the geographies of the SEP and its landscapes, and detailed different ways of traversing its waters. Moreover, similarly to the texts produced by Spanish and British hydrographers, sealers and whalers’ accounts incorporated cartographic information. Weddell’s maps in particular introduced new geographies to a transatlantic readership, linking the SEP with the Southern Ocean. The narrative and mapping techniques employed in these voyage accounts showcase the consolidation of scientific navigation methods, which were considered fundamental elements for validation of the account from the scientific geographical community. These accounts also provided new knowledge about the southernmost indigenous communities of the American continent. These documents remain valuable sources of information about encounters between European hunters and indigenous communities that no longer exist. Additionally, sealers and whalers documented their encounters with local fauna, providing new knowledge about little-known species. As chapter 2 demonstrated, surgeons on board whaling ships contributed greatly to the study and dissemination of zoological knowledge about southern marine
mammals, especially sperm whales, challenging knowledge produced by renowned European authorities in the field of natural history about the features of southern hemisphere mammals. The positive reception of these works reflects the openness of this field to amateur science practitioners in the early nineteenth century.

In addition to recognising the contribution of these actors to transnational networks of geographical knowledge, this thesis reassesses the role of British sealers and whalers in Britain’s ascendance in the Spanish American region. These actors connected the SEP to a global network of animal exploitation and commerce, linking this environment to the markets of Asia, North America, and Europe. By doing so, they eroded Spanish commercial dominion over the region in the late colonial period, and contributed to the formation of new ties between Britain and the new Spanish American states after the dissolution of the Spanish Empire.

**Change and continuity in the Age of Revolutions**

By analysing knowledge production and geographical imaginings of the SEP, this thesis has revealed forms of intellectual continuity between the late colonial and early republican periods in Spanish America. The framework of the Age of Revolutions has allowed historians to emphasise the complex and long-term political, cultural, intellectual, military, and economic processes that ultimately led to the dissolution of the Spanish Empire and the formation of new political entities in the Americas. The previous historiographical focus on the rupture caused by the independence movements has constrained analyses of this period, transforming the emergence of nation-states into an inevitable outcome. The Age of Revolutions framework allows historians to escape the entrenched views of national analysis, instead fostering a global history of socio-political and intellectual transformations. This analytical perspective emphasises the role of imperial competition as one of the most important forces driving change, colonial expansion, and empire-building in the eighteenth and early nineteenth centuries. The SEP was one of the many locales where imperial powers collided, leading to important transformations in the way in which this space was perceived, projected, and experienced.

Following Adelman, the framework of the Age of Revolutions has permitted me to think about this period as a process of reform and modernisation of the state and its administration.\(^{915}\) Government authorities, both colonial and national, sought to reform the administration of their

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\(^{915}\) Adelman, “Iberian Passages”
territories. The study of geographical imaginings and knowledge production about the SEP has shown that geographical and hydrographic knowledge was continuously thought of as an instrument for the governance of the population and for the exploitation and administration of the natural space. Geography was conceived as tool of modernisation, adaptation, and renewal. During the colonial period, bureaucrats such as José Perfecto de Salas and Ambrosio Higgins championed the gathering of geographical information and the production of knowledge to lay the foundations for subsequent reforms. Similarly, the early Chilean republican authorities (1820s-30s) promoted the organisation of geographical studies to gain accurate knowledge about the territory and its inhabitants. Adelman’s statement that the “perception of backwardness and vulnerable sovereignty framed the policies with which imperial rulers governed their domains” can thus also be applied to the early republican period in Spanish America.916 During the colonial era, for example, this led to the surveying and colonisation of previously marginal places such as Juan Fernández Island, as well as attempts to create a military settlement in the Western Patagonian Channels. Similarly, in the early republican period, fears of British colonisation after the studies conducted by Parker King and Fitz Roy motivated the mobilisation of the military to colonise the Magellan Strait in the mid-1840s.

This emphasis on continuity does not, however, imply immobility or stasis. A significant change introduced by the Independence Wars in Spanish America was the development of a print culture. This greatly impacted the way in which geographical and cartographic knowledge circulated in Chile. Knowledge about the seas, as well as the Chilean territory more generally, stopped being considered solely as an instrument of governance that circulated among bureaucratic networks, and started to be conceived as a tool for nation-making. As highlighted in chapter 4, late 1830s school geography textbooks started to teach young students about the Chilean territory, describing the different landscapes that comprised the national space. As José V. Lastarria’s published textbook remarked, students needed to be trained in world geography, but they specifically needed to be educated about their own homeland. The press also had an active role in the developing and circulating images of Chile’s territory and divulging knowledge about scientific research. Periodicals such as *El Araucano* and *El Mercurio de Valparaíso*, continuously published knowledge about the hydrographic and geographical expeditions conducted in the SEP and its coastal lands from the late 1820s onwards. The research findings of Claude Gay’s work in the Valdivia region, for example, and the hydrographic analysis conducted by Fitz Roy’s crew were published in the Chilean press for

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the benefit of the general public. Moreover, the periodical *El Mercurio de Valparaíso* often published articles on maritime topics for its keen local readership in the port city. In the 1840s, the creation of the University of Chile offered a new institutionalised space for the publication of scientific knowledge about Chile, specially about its geographical features. The journal *Anales de la Universidad de Chile* was used as a platform to discuss and divulge scientific research and knowledge produced in Chile. During the second half of the nineteenth century, several publications emerged with the same goal in the cities of Santiago and Valparaíso, thus consolidating the place of print culture in Chile. The emergence of the journal *Anuario Hidrográfico de la Marina de Chile* in the 1880s further exemplified the specialisation of scientific production in the country, as well as the institutionalisation of hydrographic knowledge.

Another crucial change in the way in which the SEP was thought about and experienced took place at the end of the Age of Revolutions. Steam-powered vessels revolutionised navigation the world over, particularly in regions were traditional vessels usually encountered contrary winds and trying environmental conditions, as was the case in the SEP. The introduction of steam vessels not only made navigation through this region safer, it also enabled scientific studies to take place. For example, Chilean Navy officer Enrique Simpson Baeza conducted a number of surveys to the north of the Western Patagonian channels in the 1870s, completing the hydrographical endeavours initiated by Moraleda almost a century before. However, unlike Moraleda, Simpson Baeza came to the conclusion that the interior channels of Western Patagonia were safe for navigation by steam vessels, and located new ports to facilitate such journeys. These findings stimulated further Chilean state engagement with the region, including assessing its economic potential especially as the Chilean government needed better information about ports for exporting the region’s timber products. Steam navigation also rendered places that were previously relevant for transoceanic navigation peripheral. Such were the cases of the islands of Juan Fernández and Chiloé. As this thesis has demonstrated, these islands were considered central for transoceanic navigation during the Age of Revolutions as they provided important stopping points for vessels on their way from the Atlantic to the Pacific Oceans. Steam navigation made these places redundant as the journey from one ocean to the other became safer and faster. In this new context, other places in the SEP, such as Valparaíso,

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917 Enrique Simpson, *Esploraciones hechas por la Corbeta Chacabuco al mando del Capitán de Fragata Don Enrique Simpson en los Archipiélagos de Gualecas, Chonos i Taitao* (Santiago de Chile: Imprenta Nacional, 1874), 19.
and to a lesser extent the ports of Punta Arenas on the Magellan Strait, acquired renewed importance as hubs of transnational navigation and commerce.

A Spanish American thalassology

Historians of all regions of the world have turned to oceans and seas to understand the circulation of people, ideas, and objects throughout history, and to examine cultural, political, intellectual, and commercial entanglements across maritime spaces. This new field of thalassology, as it has been called, has challenged previous narratives about migration, globalisation, and the construction of knowledge. Land-biased narratives in the history of Spanish America in general, and in Chile in particular, have naturalised and normalised geographical imaginations about these spaces. For example, ideas about geographical isolation, remoteness and lack of geographical knowledge are engrained in historiographical narratives of eighteenth- and early nineteenth-century Chile. Although this thesis does not seek to radically challenge this narrative, it does aim to unsettle these discourses. The focus of this thesis on the SEP elucidates the role and place of Chile and the southernmost part of South America in global histories of knowledge and science, and the imperial rivalries of the Age of Revolutions. By inverting the perspectives of land-driven narratives, maritime Chile, particularly its sea, coasts and adjacent islands emerge in a more central role than has been previously acknowledged. As has been addressed extensively in this thesis, the SEP was conceived as a crucial connecting maritime region that provided stepping stones that made navigation around the world possible. From this viewpoint, hitherto marginal and peripheral spaces such as Chiloé and the Juan Fernández Islands, and the Southern Passages of Cape Horn and the Magellan Strait, become central places in transoceanic navigation and the production of imperial geographies of the globe.

Cartographic representations of Chile and of South America predominantly depicted the shores of the continent during the eighteenth and early nineteenth centuries. While this fact does not address the lack of knowledge about the interior of the continent, it crucially reflects the geographical representation of the region in imperial narratives and its connection to global maritime networks. Spanish maps, for example, depict coastal landforms in detail, delineating coastlines, islands, and channels, situating them in both imperial and colonial geographies where the SEP had a strategic role in the defence of the empire. British cartography, on the
other hand, featured the SEP in an imperial geographical imagination that centred around British expansion towards the Pacific region and crafted a narrative of progress in the geographical and nautical sciences. As demonstrated in chapter 4, following the dissolution of the Spanish Empire, the importance of the sea and its coast in the Chilean geographical imagination did not drastically change in the new regimes that emerged out of the imperial system. School geography textbooks, for example, reproduced colonial ideas of Chilean geography. José Victorino Lastarria’s 1838 geography textbook replicated Juan Ignacio Molina’s classification and understanding of the Chilean landscape, projecting colonial imaginaries onto republican depictions of the territory. The study of this primary source has also enabled the assessment of hitherto unchallenged claims about the influence of Humboldtian ideas about the geography and the construction of landscapes in Spanish America in the first half of the nineteenth century. Lastarria’s textbook demonstrates how European ideas about landscapes, particularly Humboldt’s classification of South American geography with its focus on Andean features, competed with Spanish American knowledge and geographical imaginations, thus showing that their transfer was not as automatic as historians had previously assumed.

By the mid-nineteenth century, the republican elite had re-imagined the geographical images of Chile as a nation-state. Unlike the imperial visions, the national images of Chile envisaged the coastal geographies as a secondary landscape. As argued in chapter 4, in the early national period, islands and coastal lands lost their geostrategic importance, becoming marginal features of the national landscape. This finding is directly linked with recent scholarship that has focused on the centrality of the Andes and the Central Valley in the construction of the new national geographical imagination. In particular, analysis of early cartographic depictions of Chile has emphasised not only the marginalisation of the SEP in emerging images of the nation, but also that the process of nation building in Chile was land-centric. Indeed, cartographic images of Chile in the mid-nineteenth century, particularly those produced after the publication of Claude Gay’s *Atlas*, depicted the geographical imaginations of Santiago’s elite, who built and projected the nation-state radiating power from the centre to the peripheries. Even though the elite recognised the importance of coastal places, particularly Valparaíso, as connecting spaces to global markets, Chile was conceived of mainly as a mineral and agricultural nation.

All in all, the consolidation of power of the Chilean republican regime in the second half of the century inaugurated a period of intense territorial expansion of the nation-state towards the wealthy coastal region of Antofagasta (Bolivia) and Tarapacá (Peru) in the north, as well as the
colonisation of the southern regions of Araucanía, Los Lagos, and Patagonia. In this context, hydrographical surveys acquired renewed value, becoming an instrument of state power. For example, the expansion towards the mineral region of Antofagasta and Tarapacá after the War of the Pacific (1879-1884) was preceded by systematic hydrographical studies conducted by the Chilean Navy during the 1870s. Similarly, from the mid-1840s onwards, the Chilean Navy developed a series of explorations and surveys in the coastal regions of Araucanía and Valdivia as the state promoted colonisation there. The creation of the Hydrographic Office in 1874 led to the institutionalisation of decades of scientific research on the coasts of SEP conducted by hydrographers of the Chilean Navy. The development of this institution also contributed to the publication and circulation of hydrographic knowledge about the SEP, now available for a wider readership.

In the same period, the SEP lost coherence and unity as a maritime region. As this thesis has argued, during the Age of Revolutions the SEP emerged as coherent yet fluid and flexible space. Navigating from the Atlantic to the Pacific oceans, explorers and mariners understood the surrounding waters of Eastern Patagonia and the southern connecting passages to the Chilean littoral and its adjacent islands as part of the same region. Nevertheless, the systematic hydrographical research in the area that begun in the mid-1700s and intensified throughout the 1800s, triggered a continuous process of division in this extensive region. From the voyages of James Cook onwards, explorers, hydrographers, and mapmakers started to divide the region and make more rigid separations between the South Atlantic, the South Pacific and the Southern Oceans. In the nineteenth century, the distinction between the different oceanic regions became more marked as hydrographic, and later, oceanographic research depicted the region in more detail. Furthermore, the process of state building and the consolidation of the national boundaries and sovereignties in Spanish America during the second half of the century reinforced the separation of and distinction between these oceans. The emergence of national history narratives reinforced this trend, creating symbolic and political boundaries where they did not exist before.

The specialisation of the sciences also contributed to a stark separation between land and sea. The emergence of oceanography with an emphasis on the deep sea, and the increasing specialisation of geology and geography as distinct disciplines, led to the separation of these fields of knowledge during the second half of the nineteenth century. Although geography continued to be conceived of as a broad, comprehensive, and diverse field, as Felix Driver has explained, geographical analysis became limited to the land. As has been demonstrated in this
thesis, the boundaries between hydrographic and geographical research during the Age of
Revolutions were diffuse. Hydrographic expeditions, such as the ones conducted by Malaspina,
Fitz Roy, and Moraleda, had important information and knowledge that today could be
considered strictly geographical. Similarly, geographical reports, such as the ones produced by
colonial bureaucrats, incorporated hydrographical data such as sounding depths. The
institutionalisation of science, particularly with the emergence of specialised societies and the
creation of university courses in the nineteenth century, contributed to the stark division of land
and sea as subjects of scientific research. Only in recent decades have scientists begun to re-
incorporate more comprehensive forms of analysis that entangle oceans and lands in their
efforts to study the impact of climate change on the planet.

**Knowledge and commodification of nature**

In an era of climate crisis, it is more important than ever to reflect upon our past relationship
with the land and sea. My focus on the SEP has allowed me to analyse the origins of enduring
representations of the sea as a natural space of resources for human exploitation and profit, an
image that still exists today. In the late eighteenth and early nineteenth centuries, whaling and
sealing activities marked the starting point of the commodification of the SEP and its coastal
lands. What started with the hunting of whales, quickly became the hunting of coastal mammals
such as fur seals and sea-elephants, and other fishing activities, especially the fishing of cod.
For centuries, local coastal communities had exploited the marine resources of the SEP;
however, the sheer scale of the fishing and hunting activities that developed during the Age of
Revolutions dramatically changed the relationship between humans and the SEP environment.
Fuelled by the abundance of large marine mammals, transnational actors mainly from the
United States and Great Britain travelled great distances to conduct their killing enterprises. As
whale oil was used for illumination and as lubricants for fast-moving machinery, whalers’
actions in particular, powered the incipient industrial revolution in the North Atlantic basin,
while exploiting these animals almost to extinction.

Existing historiography has tended to analyse whaling and sealing as imperial enterprises
without acknowledging the broad impact of these hunting endeavours in Spanish American
discourses about marine environments. As this thesis has suggested, the actions of British and
U.S. whalers and sealers motivated the development of local fishing and whaling projects in
Spanish America, particularly in Chile and the viceroyalty of River Plate during the late
colonial period. Government authorities such as Chilean Governor Ambrosio Higgins were eager to develop fishing in order to bolster commerce and enhance the security of the Chilean coasts. Independence did not diminish the interest of locals in exploiting marine nature. On the contrary, it created new opportunities for both foreign and national capital to invest in local endeavours. What the whaling projects of the 1820s and 1830s in Chile reveal is an incipient process of the nationalisation of nature, which crucially included marine environments. Although many of these enterprises failed, they are underpinned by the idea of capitalising upon a resource that was understood as local.

In the following decades, whaling and fishing enterprises increased dramatically. Along with U.S. and British whaling vessels, Chile and Argentina developed several enterprises that participated in the capture and exploitation of these animals in the South Atlantic and South Pacific Oceans, reaching even higher latitudes in the Southern Ocean in their search. Furthermore, the rich waters of the SEP attracted the attention of new transnational actors, such Norwegian whalers by the turn of the twentieth century and Japanese vessels in the 1960s that continued to exploit these animals at an industrial scale. Although sealers’ activities in the coasts of the SEP decreased after the 1820s due to the massive exploitation of these furry animals, sealers endeavours continued to be developed in the mid-nineteenth century but on a smaller scale. Moreover, as John Soluri has argued, “the fur seal trade in southern Patagonia played a key role in transforming Punta Arenas from a penal colony into a dynamic hub of international trade”. This economic activity, among others, enable (and made viable) the consolidation of Chilean presence in the Magellan region.

The Age of Revolutions heralded new ways of understanding nature. Coastal and marine environments were increasingly assessed and measured in terms of how profitable they were or how they could be improved for profit. The production of knowledge was a crucial factor that shaped the way in which marine and coastal environments were perceived. In this vein, this thesis has addressed the important relationship between knowledge production and the commodification of nature. By studying how the Chilean littoral and islands were depicted, this research has shown how these environments came to be valued for their capacity to accommodate ports and contingently exploit local resources such as fish and other agricultural products. From the bureaucrats of the mid-eighteenth century and the military engineers of the late colonial period, to the first scientific expeditions of the early republican period, geographic

918 Soluri, “On Edge,” 244.
and hydrographic knowledge was used by government authorities to inform their policies and craft projects that entailed the utilisation and exploitation of the sea and coastal lands.

Finally, if the narrative of the Anthropocene, that is human actions as the dominant force shaping climate change leading up to a new geological age, consolidates, our historic relationship with different environments must be re-assessed. As this thesis has claimed, knowledge stands at the centre of the human relationship with nature, particularly with regards oceans and seas, as technology necessary dictates our engagement with these environments. The Age of Revolutions emerges as a crucial period in human history during which nature came to be thought of not only as dominion separated from society, as Bonneuil and Fressoz have argued, but very importantly as something to be appropriated and exploited for human benefit. In Spanish America, the relation between nature and society during this period is entangled with imperialism, state formation, and the global expansion of capitalism. This thesis has thought historically about how the SEP was integrated into national and imperial knowledge systems, and the ways in which different actors sought to exploit and make use of this environment, whether for their own benefit as whalers and sealers, or for the benefit of imperial or national projects. How exactly the SEP and its coastal lands were conceived as the independent Latin American countries developed after Spanish colonialism and the rise of Britain’s informal empire and neo-colonial discourses, still requires deeper analysis. This history, nevertheless, must take into consideration the distinct and sometimes contested views that have emerged from diverse actors, acknowledging the agency not only of national and transnational agents, but also of local and indigenous actors, both male and female, who for too long have been depicted at the margins of global histories of science and knowledge. Furthermore, the prominence of nature as an active agent in the history of the region, offers new avenues and opportunities to historians to develop research that entangles the problems and historical perspectives of the history of science and knowledge to the historiography of environmental history.

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